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THIS WEEK

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MAST's BrainSTorm – now you can run 98% of all ST software for only £50!

ATARI
Retouche returns – and now there's a colour version of this top-notch image handler

PC
Why Intel's cheap new 486 chip will mean budget power PCs by this summer

MACINTOSH
Where can you buy a fax modem for only £220?

AMSTRAD'S SECRET LAUNCHES

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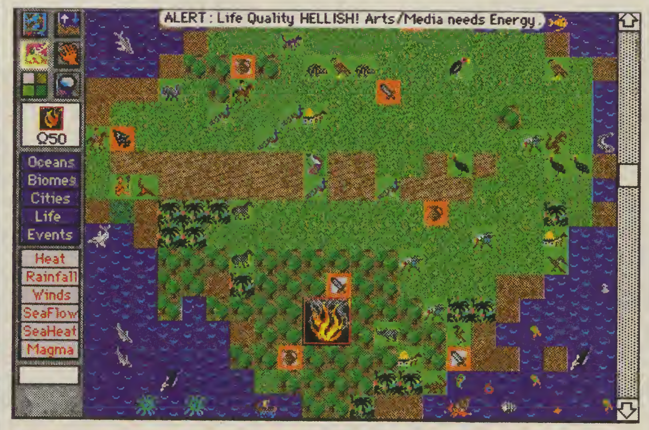
TORTURE SCANDAL HITS MIRRORSOFT

Find out why Robert Maxwell had to intervene

PLUS
REGULAR COLUMNS FOR
ARCHIMEDES
SPECTRUM
AMSTRAD CPC
C64
& 44 PAGES OF
SHOPPING EXPRESS
BARGAINS !!!



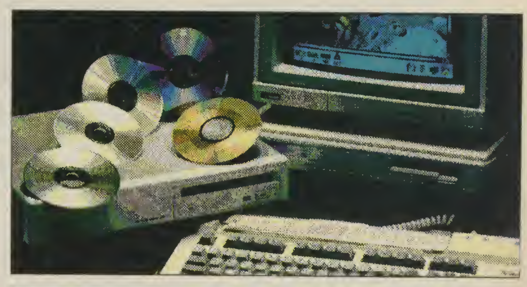
ALERT : Life Quality HELLISH! Arts/Media needs Energy

SIM EARTH:

Is this the most important leisure title this decade?

THE CD SIDE OF LIFE

Does the CD-ROM boom spell doom for the floppy?



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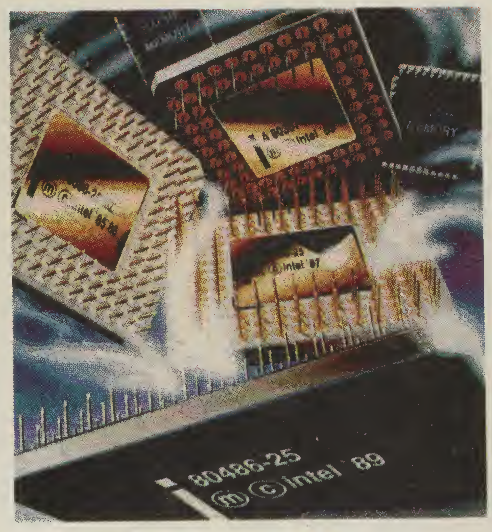
frontend

edited by Colin Campbell

BUDGET 486 PCS DUE IN SUMMER

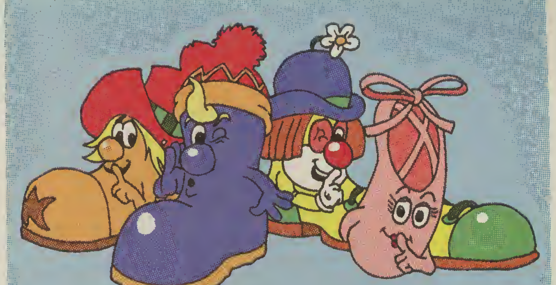


Two budget versions of Intel's 486 chip are to be launched later this year, sparking off a new generation of powerful, but relatively inexpensive PCs.

Intel is known to have been working closely with major PC manufacturers in an effort to bring low cost PCs into the shops by the summer. The PCs will be pitched in-between 386SX machines and more expensive 486 options.

Industry watchers are already predicting that the arrival of the new processors will immediately force 386SX PC prices down very quickly. When the 386SX first arrived it signalled a plummeting in the prices of 286 machines.

Intel is understood to be concerned about the imminent arrival of a cheap 386 chip clone from Advanced Micro Devices (AMD). The firm plans to counter this by offering a cheap 486 chip for the price of today's 386. ■



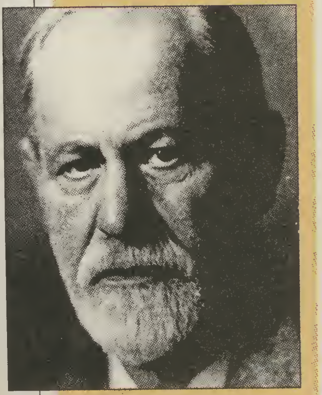
Shoe people step out

A computer game based on TV cartoon *The Shoe People* is to step out later this year.

The game will be ready for April, and footwear frenzied youngsters should find it irresistible. Characters from the TV show will be prominent including PC Boot, Sid Slipper, Gilda Van Der Clog and Baby Bootee.

But while the game will be aimed at younger games players – *The Shoe People*'s biggest section of fans are in the six to eight years old age – kiddies will have to fork out £10.99 for the 8-bit versions and £19.99 for the ST and Amiga. Unless of course they can persuade long suffering parents to dig deep... ■

Freud slips onto the PC



PC owners concerned with their state of mind will soon be able to tap into a series of self-analysis programs due to be launched in the UK.

Birmingham-based Psychcess has imported a catalogue of American programs including Personality Profile, Dr Shrink, Self Esteem and Values and Total Stress Management.

There's also a series of more practical options such as Never Fat Again, Live Like a Millionaire on an Ordinary Salary and The Art of Communication.

Ian Stringer, the psychologist who founded the company said: "The self-help packages are designed to enable people to make a positive contribution to improving their lifestyle while having some fun.

Prices range from £50 to £150, but there's also a batch of cheaper shareware programs available. For a free catalogue call 021 323 2282. ■

NeXT aims for big sales success

The recently launched NeXT workstation has wowed computer users and professionals alike, but it has yet to prove itself as a commercial success. Surprising then that the eponymous NeXT Inc reckons the machine will have scooped 50 per cent of the workstation market by the middle of 1992.

Newly appointed UK sales director Tony Tomlins claims that established names in the professional workstation sector – such as Sun and Sparc – would lose out to the NeXT machine. "Last year the professional workstation market worldwide shipped between 30,000 and 50,000 units," he said. "1991 should see this figure rise to between 80,000 and 100,000 units and by 1992 it is NeXT's intention to have 50 per cent of this market."

Optimistic estimates currently put NeXT's share at a measly four per cent. But an increasing availability of software, and the imminent arrival of a colour version of the NeXT, should signal an improvement.

NeXT is the brainchild of computer guru Steve Jobs, who was originaly responsible for the Apple Macintosh. ■

SOUNDS LIKE A SMASH HIT

Hit Kit takes the drudgery out of composing music and means you don't have to be a musical genius to write great tunes.

Released by Gadjits Music Software, the Hit Kit composition software helps you lay down professional sounding drum tracks, arpeggio patterns and bass lines to create a wide range of musical styles.

It can be used on its own to create complete pieces of music, or in conjunction with your existing sequencer. Versions will be available for most ST and Amiga sequencers.

Price not available – contact Gajits on 061 236 2515. ■

Adam was a pygmy

Adam, the biblical father of mankind, was a pygmy living in darkest Africa, according to recently published computer aided research.

Professor Gerard Lucotte of the College de France in Paris used a PC to analyse blood samples of modern males. The computer highlighted which parts of the volunteers' genetic fingerprints it believed would be present in our ancestor and compared them with the genes of people worldwide. The genetic material was found to be prevalent in men of the Aka tribe in the Central African Republic.

Lucotte's research will upset the scientific establishment which has long believed people evolved from different regions. ■

Computer voice means curtains for advertisement actors

Specialist software which imitates the human voice could shortly be replacing actors in radio and television voice-overs.

The system is based on *Voice Navigator II*, from VoiceQuest, which allows computers to 'talk back' in response to spoken instructions. By altering inflection and time, a sound engineer would be able to custom create the perfect voice for each commercial.

The software is being developed by Manchester-based company The Voice. A spokesman commented: "The technology is available and it would be madness not to exploit it. I don't see any ethical problems with the actors. I know from professional experience the hassles and aggravation of finding the perfect voice for commercials. Musicians have been using digital equipment to enhance and create music for years now, why shouldn't commercial producers?

"I know it might hit actors in the pocket, but this is a profit based business, not a charity."

A spokeswoman for Equity, the actors' union, said the thought of a machine replacing an actor was "very sad". "A lot of actors rely on commercials to keep their heads above water," she said.

All aspects of the voice can be engineered using the software, including pitch, regional accent and sex. The equipment can be connected to standard studio equipment, and the computer generated voice plays back through a digital sound desk. ■

TAKEAWAY A BARGAIN

Epson laptops which would normally set you back £1,400 are being sold by Crown Computer Products for a tempting £399.

The Epson Equity laptop is fully IBM compatible and features twin 3.5-inch floppy disk drives. It runs at a satisfying 10MHz and comes with 640K of RAM.

Lancashire-based Crown says it is able to sell at such a keen price because it has "literally thousands" of the laptops in stock. The firm's Sharon Aspinall told *Express*: "The reason we can sell them at these very low prices is because we have bought so many of them. They're going to be very popular as they should be at that price.

"It's not often buyers can obtain quality kit at this sort of price."

Buyers will be offered the laptop along with a carry case, transfer communications package, AC Adaptor and a copy of MS DOS.

The internal rechargable batteries can run for up to seven hours continuously, and the machine weighs 5.9 kg. Call Crown on 0704 895815. ■

All guns a-blazin'

Gunship 2000, the sequel to heavy duty helicopter sim *Gunship* will be ready for early summer, publisher MicroProse has announced.

The original sold over 100,000 copies and taught a complete generation of game players the difference between collective and cyclic pitch.

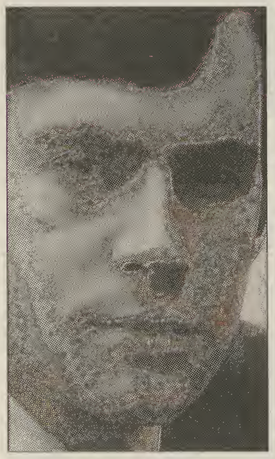
In *Gunship 2000* the player has a choice of three up-to-date US gun platforms and for those wanting to be topical there are scenarios that involve missions in the Persian Gulf.

A choice of single, multiple and campaign missions is available and there's even a mission 'construction kit.'

Ground view is three dimensional and sound can be from the PC's speaker or from supported sound cards (Ad-Lib, Tandy, and Roland).

Gung ho boss Bill Stealey boomed: "*Gunship 2000* will be several years ahead of any other helicopter sim available." It will cost £39.99 on the PC. ■

Labour: 'we'll spend more on computing'



• *Gordon Brown, shadow secretary to industry – pledge to help out small companies.*

The Labour Party has pledged to pump unprecedented cash investments into Britain's computer and high-tech industries, if it wins the next election.

Labour points to an increasing number of technology enterprises going bust in the current economic climate. It says that without Government investment, Britain will fall behind in the international innovations race.

Gordon Brown, the shadow secretary to industry, said tax incentives would be offered to those companies which spend more on research and development. Smaller companies would be protected from the ravages of recession through Government spending. And Governmental agencies will be forced to spend at least five per cent of their research budgets with companies employing less than 500 people.

Brown plans to boost Government spending on civil research and development from the current 1.7 per cent of gross domestic product to 2.5 per cent, the European average.

Innovation Centres would be set up for fledgling businesses – allowing developers to bring good ideas to market. The present Government has been criticized for not supporting our computer industry. Detractors point to the sale of British transputer manufacturer Inmos to a European consortium last year. ■

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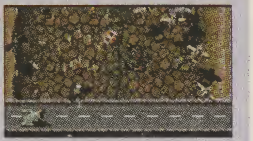

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A new monitor could change the way you look at things in more ways than one. See how on page 48

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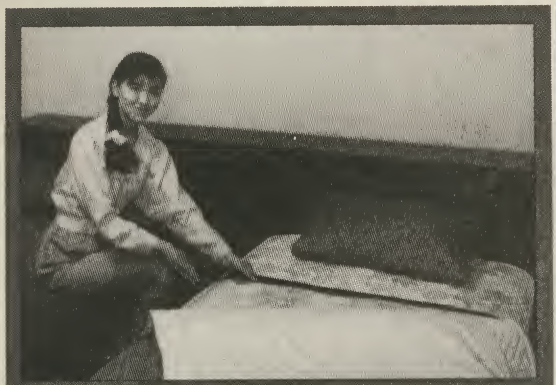
The Amiga has a mass of expansion options – check them out on page 51



• Beauty sleep: high-tech kip.

Computer sensitive sleep

A computer system which can make your sleeping hours as comfortable as possible has been developed in Japan.

It's based on a flexible sensor designed to be attached to your mattress. The sensor measures frequency and pattern of body movement and could be used to adjust the environment of a room and even turn appliances on and off.

As the body moves from being awake to drowsing and in to a deep sleep, the sensor notices the chain and can pass the information on to other equipment.

The external equipment can then adjust the temperature, humidity, light and environment to suit the body's optimum needs. Appliances can be controlled and for the first time the air conditioning could be fully sensitive to a person's needs.

Two people with a sensor each could feed a system that would then work out a mean difference and adjust the environment to a suitable mid point between the two requirements. ■

Playing for Rome in a day

From June, Megadrive owners will have the chance to step back in time to the days of imperial Rome.

In Centurion – Defender of Rome, you'll be able to take on the role of emperor and, by building a few ships and gathering up your army, you'll be expected to expand the Roman Empire. Or, once you've tired of battle, enter a chariot race, fight a few gladiators or try your hand at seducing Cleopatra.

Publisher Electronic Arts describes the game a little grandly: "*Centurion* tales cinematic adventures to a new plateau, because it really offers gameplay." ■

New desktops, laptops, portables, CD-PC – ar

AMSTRAD PREP
LAUNCHES FOR

Speculation on Amstrad's forthcoming round of hardware launches has reached fever pitch, with industry watchers eagerly predicting a trio of surprise launches for next month's Hanover Messe computer fair.

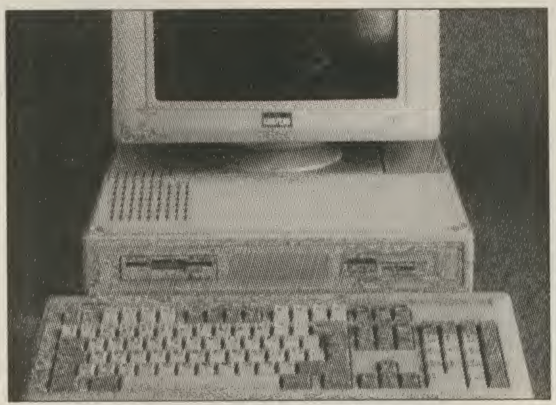
However, *Express* has uncovered salient details of Amstrad's plans for the next few months, encompassing desktop PCs, laptops, portables and even the six-year-old PCW range.

Amstrad has already stated that three new machines will be unveiled at the Hanover Messe on March 15, but is refusing to even hint at the nature of the hardware. We understand the contenders will include:

- A new portable based on the existing ALT range will definitely be unveiled with double capacity hard drives. These will eventually replace existing models, offering buyers more memory without a price penalty. The machines are unlikely to be available here until the early summer.
- Small footprint versions of the 'Generation 3' series of top-end PCs will be launched. And a number of PC3000, plus printer and software bundles, will also be announced in the near future. The new machines may come under a PC4000 tag, and there exists the real possibility of a 486 model.
- Sources within Amstrad insist that smaller than A4 sized laptops are also in the pipeline. The machines will be simple and inexpensive affairs. Amstrad has opted for clamshell screen style rather than the straight Z88 type configuration.

Buyers will be offered a low cost 8086, as well as a more expensive 286 option.

- Colour versions of the ALT laptops may also appear for private viewings, but they will not be shown to press or public until later this year.
- A planned high-end PC with CD-ROM drive is unlikely to surface at Hanover, but should be launched at the Which Computer? Show in Birmingham this spring. Some free information CDs will be included in the package, which will cost about £1,500.
- The revamped PCW models are ready, and awaiting launch,



• Generation 3 PCs - plans for versions with smaller footprints

European IT falls behind

The European Commission has declared that an investment of £700 million is needed to break the existing US/Japan stranglehold on the supercomputing industry.

A panel comprising academics and other power-users, under the aegis of DGXIII, the EC department which deals with information technology, recently returned its findings on the subject. The consenus reached was that Europe accounts for 30 per cent of supercomputer users, but has no major manufacturers. In short, it is being left behind in the technology race.

Japan is investing £770 million in a Sixth Generation project (*Express* 119) while the US makes yearly investments into supercomputing. If Europe is to enter the big league then government finance is crucial. ■

Smallest PC cut in price

Poqet Computer has reduced the price of its Poqet PC, the smallest IBM compatible computer, to £999. In addition, 1Mb and 2Mb expansion cards have been launched.

Despite its technical excellence the Poqet PC has yet to make much of an impression on the portables market. But UK managing director Mike Harris reckons the new sub-£1,000 pricepoint could change all that.

"Breaking that price barrier is a remarkable achievement when you consider the advanced technology involved," he said. "We also hope to be introducing a series of special deals in the near future, targeted at specific widely used applications suitable for a truly portable machine."

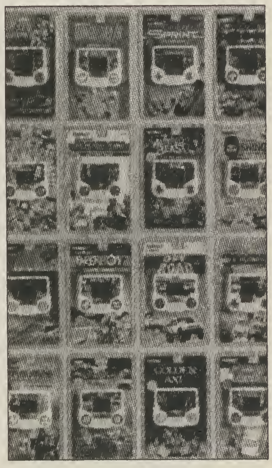
Pricing on the 1Mb and 2Mb cards has been set at £299 and £529 respectively. And the 512K RAM card has been cut in price from £199 to £177. For more information call Poqet on 0753 580018. ■

Pocket-sized power for top games titles

Now can you play top computer games like *Shinobi* and *Golden Axe* sitting on the bus or hiding behind your desk, and stick them in your pocket when you've finished.

Twenty best-selling titles, which also include *Paperboy*, *Thunderblade* and *After Burner*, have been added to the Grandstand range of LCD handheld video games. They will retail for just £19.99

Grandstand is aiming the games squarely at the 7 to 16 year olds taking advantage of the high awareness this age group has of the computer gaming phenomenon. The company plans to expand the range throughout this year to take in all the most popular titles from across the computer gaming spectrum. ■



• 20 top titles from the screen to your pocket.

– and a revamped PCW on the way

EPARES MAJOR R PC RANGE

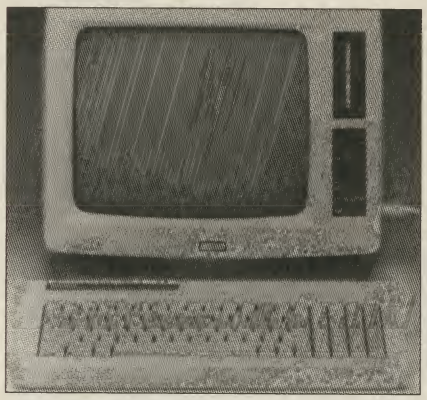
but Amstrad will probably unveil these in the UK first. The new models will be based on the existing 8512 and 9512. Instead of the standard – and obsolete – 3-inch drives, the machines will come with 3.5-inch drives.

Both PCWs will come with paper white screens – the black on green screens are being phased out. The new 8512 will be sold with dot matrix printer, while the 9512 will continue to come with a daisy wheel model. Amstrad is also sticking with the CP/M operating system.

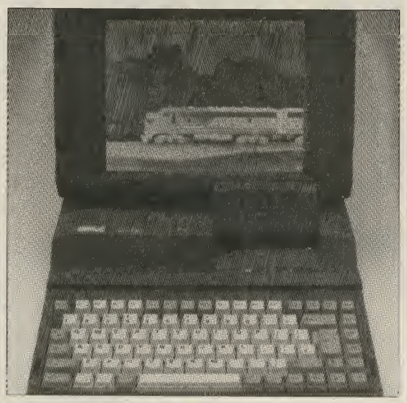
The firm privately feels that its hugely popular PCW is looking dated, and is planning to make some aesthetic changes to the casing. The decision to move up to 3.5-inch drives has as much to do with the difficulty of obtaining 3-inch drives as anything else. Opting for the more standard 3.5-inch drive would allow the new machines to read and write to and from PC disks, thus justifying the machine as a serious, but low cost, business option, while giving PC compatibility.

The company has already cut the price of the entry level 8256 to £299 in an effort to clear dealer channels. New machines will be backed up with huge television and press adverting campaigns – the relaunch will represent the PCW's biggest boost in years.

A spokesman for Amstrad last week catagorically denied that the widely rumoured 'PCW for the 1990s' would be seen at Hanover, and scotched rumours of a CD-ROM based PC launch. However, he said such moves could not be discounted. ■



• *PCW: relaunch in the offing*



• *ALT: bigger hard disk models*

Cluedo
MASTER DETECTIVE
More Suspects, More Rooms, More Weapons

Cluedo Master: ***More suspects and victims.***

Crime calls for the C64

A sophisticated C64 edition of the *Cluedo* detective board game has been released for aspiring detectives who may have found the original version slightly too simple.

The new game features 10 murder suspects, 12 possible scenes of the crime and eight murder weapons.

Where, with what and by whom was Mr Boddy, of Boddy Manor, murdered? Who will solve the crime first, you or the computer? *Cluedo Master Detective* costs £9.99 for cassette and £12.99 for disk. It's also available for ST, PC and Amiga. ■

Classroom micros no problem for modern kids

Today's computer-literate kids are benefiting in maths lessons thanks to micros in the classrooms.

A report by the schools inspectorate reveals that modern technology is wearing away the traditional loathing of division and subtraction as children as young as five start using calculators and computers to help solve tricky numerical problems.

In contrast to persistent claims that standards of education are falling in UK schools, the report says that the level of numeracy among 5 to 11 year olds has improved significantly.

The current generation of schoolkids have few qualms about using modern technology in the classroom since they already use computers to play games at home. ■

More memory than a hard card

A PC card that can offer your PC more on-board memory than the average hard disk has been launched for all PCs, from the lowly XT to the high end PS/2 workstations.

Hyperam Classic from Hypertec offers up to 32Mb and can be added to any machine starting with as little as 512K, making it an ideal start system that can be added to as funds permit and applications demand.

Classic supports EMS 4.0 in hardware and can be configured to any mixture of expanded/extended memory up to 16/16 Mb.

More details about mammoth memories from Hypertec on 0672 63936. ■

Laptop and PC price slash

PC manufacturer Elonex is to cut the prices of its 386 laptops and desktop PCs.

First to feel the price slash are the 386SX laptops which are substantially reduced by £200. The 40Mb model is down to £1,295 while its big brother the 100Mb model costs £1,495.

Ari Gershuni, Elonex's marketing chief said: "With high capacity storage and memory expansion available users are less inclined to view them as second best to DTP machines."

He added that the availability of power features in laptops made users more willing to purchase laptop machines instead of the larger desktop models.

Elonex is also bringing down the prices of its 386 desktop models. More information from Elonex on 081-452 4444. ■

16-bit car controller

The gadgets under the hood of your car could have more power than the computer you use for work or play.

German industrial giant Siemens has designed a 16-bit microcontroller for controlling time critical automobile operations like ABI anti-lock brakes.

This clever slice of silicon incorporates a processor, data memory, operating system and program in the space of just 70mm^2. ■

Activision UK fades away

The sad saga of Activision UK looked to be at an end last week, as staff cleared out of the firm's Reading office for the last time.

Activision's parent company in the US had been winding the operation down since last summer, in an effort to save itself at home. However, Activision was bought out by The Disk Company which has now decided to finish Activision UK off for good.

Future Activision games will probably be imported from The Disk Company's Paris office.

The irony is that Activision UK was one of the most successful, not to mention the most flambuoyant, leisure software publishers in the UK. Apart from publishing big name games from the United States, Activision UK also sourced many British games and made them famous all over the world. ■

THE WEEK IN VIEW

Rob Ainsley, one-time editor of 8000 Plus and New Computer Express, welcomes a revamped PCW...

It is no surprise that Amstrad is considering a rejig to the PCW. This machine – the brainchild of chairman Alan Sugar – has sold well over a million units and has become the standard tool for writers, journos, one-person businesses and even the clergy. It was cheap at the price in 1985 when it first came out and it is still extraordinary value for money now.

Why change it, then? And why has Amstrad recently dropped the price of the basic PCW8256 to £299?

The answer lies in the perceived value of the PCW. With its non-standard and increasingly expensive 3-inch drives it poses great problems of compatibility with that PC at work, which more than likely uses a 3.5-inch drive. And PCW owners – previously dismissed as uninterested in any machine but their own – are increasingly demanding compatibility with the computing world outside, a compatibility their disks don't give them.

Locomotive – makers makes the LocoScript word processor supplied as standard with all PCWs – recognised this need some years ago and consequently brought out a PC version of LocoScript for users with both formats.

So, by changing the disk format to 3.5-inches – a minor adjustment to the manufacturing process – Amstrad can be seen to provide a better value for money package, and fight off the challenge from the ultra-cheap PCs (though the price will undoubtedly go up). If the machine was also improved with the addition of an RS232 interface, another shortcoming of the PCW, the package would be complete.

It is a good move and the new PCW will, at the right price, be better value; but only because of the original decision to use the then cheap, but ultimately problematic, 3-inch format when the PCW first came out. Only two cheers, then, for Amstrad. ■

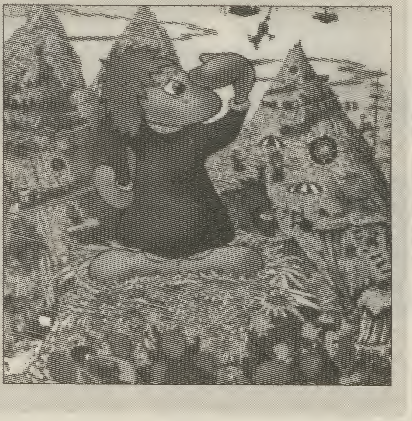
Pirates attack cutesy Lemmings

Games software house Psygnosis was last week reaping the bitter rewards for publishing a game which has appealed to reviewers and gamers alike.

Cutesy action puzzle game *Lemmings* hit the streets on February 15, and within two days a fully cracked version was available on scores of bulletin boards.

The Liverpool company admitted it was "very surprised" that crackers had broken the game's piracy protection so quickly. Operations director Roy Barker commented: "Piracy is the disease of computing, but we've come to expect this sort of thing now. I suppose it makes it worse when you have a game which has attracted as much attention as *Lemmings*.

"It's just a shame for the programmers and people who have worked so hard on the title." ■



• **Lemmings:** ***pirates moved quickly.***

£290,000 debt angers creditors

WHIZZKID COMPANY CRASHES

A Scottish computer business founded by a schoolboy computer enthusiast has crashed amid claims that it was operating in "cloud cuckoo land".

Gary Marshall, now aged 20, set up Star Computer Systems, five years ago for an initial outlay of just £5. The company has now announced debts of more than £290,000.

In August last year Star opened Scotland's largest computer store, despite never having recorded a profit. And earlier this month angry creditors met with Marshall and the official liquidators and accused the company of overstretching itself. Marshall said perhaps he had tried to run before he had learnt to walk.

Marshall started the company with a £5 advert in the trade press offering computer support services. He proudly claims that since then: "there has been no outside investment whatsoever."

Star UK grew rapidly and became an incorporated company in 1987 and took over a small office, operating on a mail order basis. The following year it moved into a retail shop.

But early in 1990 Marshall set his sights a bit higher and reckoned that the company could: "take computers onto the high street in a way that was unprecedented. We were confident we had the expertise and products to survive." In August, Star moved into a £1,000 a week premises in Aberdeen's main shopping area, Union Street.

Unfortunately suspicious suppliers, perhaps aware that the company could be taking on more than it could handle, did not agree, and dramatically restricted the amount of supplies Star could order. The company did not have the resources to weather this storm and the debts rapidly piled up.

Marshall said at the meeting of creditors, "I feel genuinely very sad for the creditors involved and also feel very sad for the company." ▩

● Marshall's company is not in any way affiliated to the leading printer and peripheral manufacturer Star.

Tool up with Screenworks

A screen saver for Microsoft Windows that offers colour and graphic display has been launched by Software Toolworks.

Screenworks blanks the screen to save the monitor from phosphor burn out and displays rotating fractal images, starburst fireworks, a clock or, if required, a blank screen. The delay between the last keystroke and the screen saver coming in can be adjusted to last between one and 99 minutes.

Also included in the package is a collection of some six dozen icons and a password protection routine for Windows.

For £24.99 *Screenworks* can be bought from Software Toolworks on 0444 831761. ▩

Commodore tops sales

Commodore sold more computers than any other firm in the UK last year, according to figures from leading market research bureau Dataquest.

The company, with sales totalling 208,400 units, had a 13 per cent share of the market, over 2 per cent more than its nearest rival IBM which shifted 174,850 units. Commodore's arch rival Atari came fourth with a 7.3 per cent share (117,150 units), losing third place to Compaq which managed to claim a 8.1 per cent bite of the cake (130,000 units).

Amstrad, Apple and Acorn came fifth, sixth and eighth respectively, the remaining positions being filled by various PC clone manufacturers.

When it comes to individual models the Amiga 500 claimed pole position with a commanding lead. It sold a massive 187,250, almost double that of the runner up, the Atari 520ST .

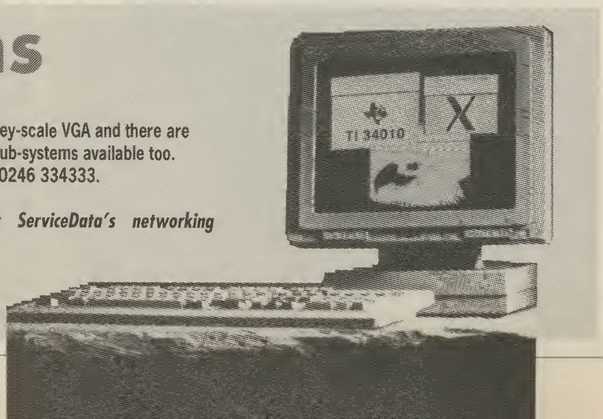
But it was not all glory for Commodore. Amigas accounted for an incredible 90 per cent of the company's total sales, suggesting that its much heralded drive into the PC market has not been a success. ▩

Action stations

A Networking Workstation that is PC compatible and can run all the major operating systems is to be launched by ServiceData at the spring Which Computer? Show.

The network stations are based on 286 and 386 technology and are available in configurations to suit any application. A basic system could be 512K of memory, but that can be expanded to 16Mb.

Display is 64 grey-scale VGA and there are optional graphics sub-systems available too. Service Data is on 0246 334333.



• ***Suit yourself: ServiceData's networking workstation***

Maxwell intervenes to stop electrocution sequence

TORTURE HORROR GAME SOFTENED FOR AMNESTY

A Mirrorsoft game which featured sickening torture sequences has been drastically altered just before its launch – on the request of Amnesty International.

The widely respected movement, which works on behalf of prisoners of conscience, objected to sequences in the game *Killing Cloud* which involved the violent interrogation of police prisoners. Amnesty contacted Mirrorsoft owner and media tycoon Robert Maxwell appealing for intervention and Maxwell obliged by demanding that Mirrorsoft change the game before its launch.

Killing Cloud is due to be released on the ImageWorks label and was programmed by British development team Vector Grafix. The arcade adventure features a San Francisco cop who must find a villain responsible for a deadly toxic cloud hanging over the city.

At the end of each level the player must interrogate prisoners for the information which will lead them on to the next round. Gamers can make use of limited electrocution techniques or a truth serum, but the prisoner must be kept alive.

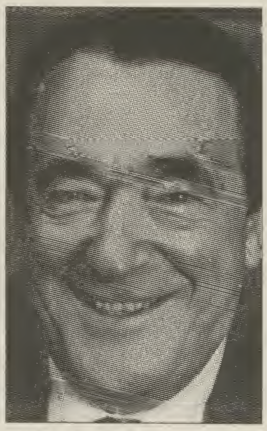
Following a preview of the game in French magazine *Tilt*, a complaint was forwarded to Amnesty International. A letter was then sent to Maxwell, who responded stating that a final version of the game would not feature any torture sequences.

Mirrorsoft boss Peter Bilotta defended the sequence saying it was "a cartoon" compared to many video games. He confirmed the sequence had been changed, but refused to reveal the nature of the alteration.

"At first we didn't see that it was any different from any number of games. But we do have a duty to respect other peoples' opinions and we didn't want to offend," he said.

"Mr Maxwell takes a great interest in anything he does, and he asked for all the information on the game."

Killing Cloud is due to be released in the spring. ▪



• Maxwell: Ordered gameplay changes.

Computer mislays £500 million

A massive £500 million discrepancy in Foreign and Commonwealth Office (FCO) accounts is being blamed on the installation of a computer system known to be faulty.

The FCO claims it was forced into using the system early last year despite being aware of its shortfalls when department's existing system suddenly, irreparably broke down. The resulting series of multi-million pound incongruities at the Government department has since been uncovered by the National Audit Office.

To further complicate matters, the company which provided the system, Memory Computer Ltd, went bust shortly before it was rushed into full operation.

National Audit Office controller and auditor general, John Bourn, said that there were imbalances on four FCO accounts of £10 million, £6 million, £5 million, and £5 million respectively.

The FCO has made assurances that no money has actually gone missing, but the cost of the operation to get the system working properly and find out exactly where the funds have been misplaced is already running into millions itself. ▪

Still solution for colour digitising

A colour digitising solution for the Amiga and ST that puts everything in one package is due from Scottish peripheral manufacturer Rombo.

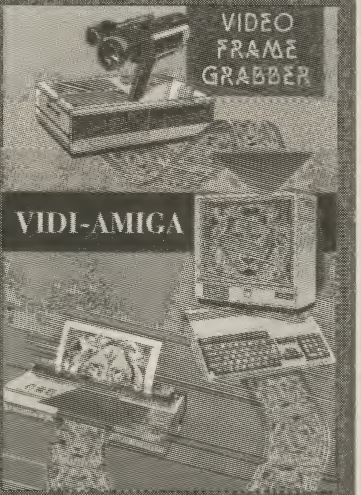
Called The Complete Solution, the sub £180 package contains everything an Amiga or ST user needs to get digitising except a video source.

The Amiga package contains *Vidi-Amiga*, *VidiChrome Amiga*, *Vidi-RGB* and *Photon Paint*.

ST owners get *Vidi-ST*, *VidiChrome-ST*, and *Vidi-RGB*. In order to use the complete Vidi packages to their best, a 'still' video source is necessary. This could be a video camera or a video recorder with a perfect 'still' function.

Rombo already sells a similar complete solution package for the PC and does various digitising and peripheral products for other computers.

The £179 Amiga and ST package can be bought from Rombo on 0506 414631. ■



• Video Solution: Just about all you'll need.

Lotus regroups to aid new arrival

Lotus has followed its aquisition of the popular Ami word processor with a regrouping move that will give separate product groups.

Ami joins Ami-Pro, Windows, SmarText and Manuscript in the word processing group. Other groups will centre around spreadsheets, information management and graphics. The move is timed to co-incide with the imminent arrival of a Windows 3 version of Ami.

As well as the formation of product groups, Lotus has pledged to increase its customer service investment in the UK by 50 per cent.

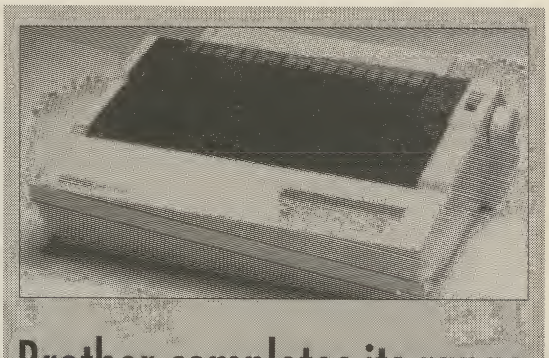
More information from Lotus on 0784 455445. ▪

Amiga colour slide show

Amiga owners looking for a sensible solution for presentations will be interested in a program that turns files into slides, utilising 24-bit colour.

Amiga Centre Scotland has joined IMC to perfect a system that takes the Amiga screen files and turns them into illustrations with 4,000 lines of resolution.

The Amiga file is sent via the SCSI port on the Amiga to a digital film recorder which outputs the image in up to 16.7 million colours to standard slide or print film. Amiga Centre Scotland is still mulling over a name, and a price, but an announcement is imminent. Call Amiga Centre Scotland on 031-557 4242. ▪



Brother completes its range

Brother is launching two new low-cost printers to complete its dot matrix range. The 24-pin 1324 and 9-pin 1309 models will allow the use of a variety of stationery with their rear and bottom feed modes and tear-off and paper park functions. Both have a standard 8K buffer and the 1324 can be upgraded to 32K with an optional RAM chip.

On sale now, the 1324 is priced £319 and available in April the 1309 will cost £239. For more information call Brother on 061 330 6531. ■

Has Nutek foiled Apple's legal strangehold?

WORLD'S FIRST MAC CLONE

by Ian Wrigley

A new – and possibly highly litigious – chapter in the Macintosh's history has been opened this month following an announcement by NuTek Computers Inc., a Californian-based company.

NuTek has revealed that it has become the first company in the world to design the logic chip set and software required to produce a fully-functioning Mac clone. Using a 'clean room' technique in an attempt to avoid lawsuits from Apple, the work has taken two years and has involved a full-time team of more than 12 software engineers.

According to NuTek's President, Benjamin Chou, "NuTek expects to be the first to deliver the full set of technology required to develop and manufacture a true Macintosh-compatible computer – a significant and long-awaited breakthrough for the personal computer industry. NuTek will do for Apple Macintosh users what the first developers of IBM-compatible computers did in the early 1980s – it will open up the market to increased innovation and competition."

CLEAN ROOM

Apple is notoriously litigious – its claims against Microsoft and Hewlett-Packard over the 'look and feel' of the Macintosh interface lasted years and cost all the companies concerned many millions of dollars before a United States judge dismissed the cases last year. Because of this, NuTek has been extremely careful to develop all of its hardware and software in what is known as a 'clean room' development procedure. This involves being able to prove that Apple's code was not inspected or used, and that all the software was produced using only publicly-available sources (such as Apple's Inside Macintosh set of reference manuals, which detail the ROM addresses and precise functions of all the routines which applications programmers might wish to call).

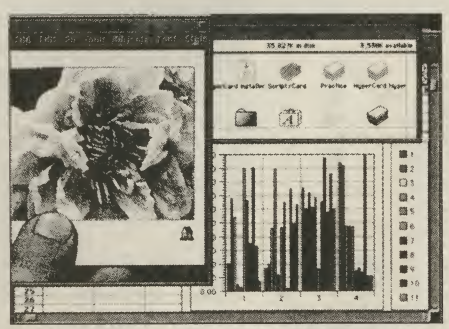
The development process has been fully documented by the company, which has also employed Gervaise Davis III, a Silicon Valley computer law and copyright attorney, to advise on any possible legal problems. Davis, an internationally known expert on such matters, has said that he does not believe that any of NuTek's code infringes on Apple's copyright.

CLONES NOW POSSIBLE

NuTek will be supplying OEMs (Original Equipment Manufacturers) with the three main elements required to produce a Macintosh clone; these are:

- The logic chips required to manage hardware functions such as disk drive and memory control.
- The operating system which manages the basic internal functions of the computer.
- A user interface, enabling users to operate standard, off-the-shelf Macintosh applications.

The logic chips come in the form of three VLSI (Very Large Scale Integration) ASICs designed by NuTek. Two of these provide an interface to a standard 680x0 chip which is compatible to the Mac's NuBus interface, while the third handles all the peripheral input and output.



• Nutek sidesteps legal issues by using the Motif user interface on a Mac clone.

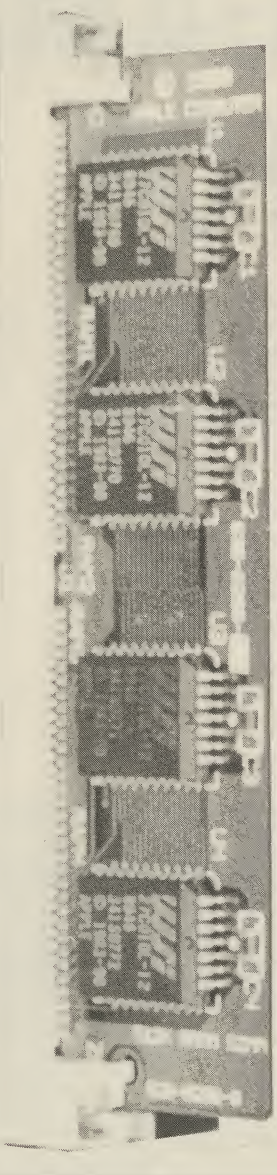
The operating system comprises more than 250,000 lines of code and duplicates more than 760 functions which are performed by the Macintosh operating system.

The user interface is based on the Open Software Foundation's (OSF) Motif interface, a windows-and-menus based interface similar to the Mac's. OSF is a consortium of companies including IBM and Hewlett-Packard which aims to promote computer standardisation by providing specifications for such things as user interfaces in the hope that all companies will adhere to one standard in the future.

NuTek says that it will be in a position to ship all three elements to OEMs by the fourth quarter of this year. It estimates that OEMs will require another six months or so before Mac clones begin to appear. But when they do appear, the clones should, to all intents and purposes, act exactly like normal Macs – they should run all standard Macintosh software without modification and should be able to use virtually all third-party add-ons and peripherals.

LIKELY SPECIFICATIONS

By July or August next year (assuming that Apple doesn't take NuTek to court) we should be seeing the first Macintosh clones appearing. Because many companies, especially in the Far East, are geared up to producing extremely low-cost computers, the machines will certainly cost far less than the current Macs. And because the machines will use the 68020 or 68030 chip it's likely that the machines will be colour, and rival the Mac II for speed. Although it will take a couple of years before costs are down to the lowest possible level, it is quite likely that we could be seeing a colour Macintosh clone, running as fast as a IIcx or IIci, selling for the same price as the 'official' Mac Classic – less than £1,000. Already, NuTek's system has been used to create prototype colour Mac clones, proving conclusively that it can be done – the only question remaining is when. ■



THE CLONE WARS

It has taken a third party company more than seven years from the introduction of the Macintosh to the production of a 'clone' BIOS (Basic Input/Output System). This contrasts markedly with the IBM-PC clone market, where companies such as Phoenix began producing clone chips within the first couple of years of the machine becoming popular in the early 1980s.

It is true to say that cloning the Macintosh operating system is a somewhat less trivial task than cloning the IBM BIOS. But this is not the major problem. What has worried potential clone-makers more than anything else is the fact that Apple is an extremely litigious company. Until the 'look-and-feel' case against Hewlett-Packard and Microsoft was dismissed last year, the question of whether it would be at all legally feasible to produce a Mac clone depended on the result of the case. If Apple won a claim that other companies' user interfaces infringed Apple copyrights, then there is no doubt that a computer which operated in exactly the same manner would certainly be deemed to be infringing that copyright. But now that question is once again open – and clearly NuTek believes that it would win any potential court battle.

The only Macintosh 'clones' which have so far been produced have relied on the owners procuring a set of genuine Mac ROMs – either from an old Mac or from one of the few dealers who sell them. Of these clones, only the Outbound Laptop (see *Express* 111/112 for a review) has achieved any measure of popularity, and one of the major reasons for its success is that Outbound managed to gain Apple's official approval for the product.

Apple's attitude contrasts interestingly with IBM's. Although IBM was initially unhappy with the clones of its PC, recently it seems to have accepted them – indeed, some consider that IBM is secretly quite pleased with them, since it persuades people to 'stay on the IBM route'. Many people now consider that Apple's main hope of remaining a major player in the personal computer marketplace is to avoid prosecuting clone manufacturers, so that more people will become committed to the Macintosh standard.

Apple has said that it can't comment on the situation because it hasn't seen NuTek's technology; but most observers expect that legal action is imminent; it would be extremely optimistic to expect Apple to accept a clone manufacturer without a battle.

NEW

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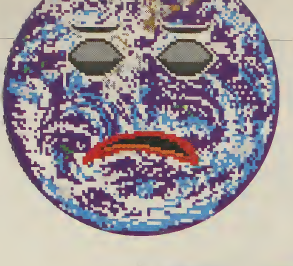


EARTHLY PLEASURES

A new educational era of the computer industry has begun with Ocean's release of SimEarth. Dave Golder plays God to see just how this might happen.

Entertainment software publishers are never short of superlatives when releasing new products. So when Ocean claims that its latest title is, "a seminal watershed, representing the embarking of this industry on another era," you would be forgiven for writing this off as a certain amount of corporate hype. But in one sense at least the company can honestly claim that it will change the world.

Controlling events on a planetary scale is the very premise of *SimEarth*, available now for £39.95 on the Apple Mac and IBM PC with ST and Amiga versions due in the summer. The game – sorry, 'software toy' as developer Maxis would like us to think of it – is the long-awaited sequel to *SimCity*, where players built and supervised cities.

SimEarth gives you a whole planet to play with; Earth if you really want it, but there are six others to chose from or the chance to create a whole new one. Ideal for the ultimate megalomaniac, it offers you the chance to play God and nurture your chosen planet from a lifeless chunk of rock and water to a world populated by technologically advanced intelligent creatures.

And these creatures need not be human, or even mammals, for depending on how you chose to guide events, you are just as likely to end up with birds, insects or even dinosaurs forming civilisation.

VIEW THE ENTIRE WORLD

When playing *SimEarth* you view everything from a satellite looking down at your chosen planet's surface and the main screen is a map of the entire world. The surface is divided up into thousands of squares and you can look closer at any area using the edit window.

You can affect events either on a global scale or relating to an individual square. A host of natural disasters and landscape-forming features are at your command – meteors, earthquakes, volcanoes and tidal waves. You can choose where to place deserts, forests, swamps, cities and animals and even decide how much energy, and what type, to devote to science, agriculture, medicine, communications or philosophy. There are thousands of ways the scenarios can develop.

Everything you do affects the delicate balances that exist on your planet. Too much solar energy and the ice caps will melt. Over reliance on certain types of energy will cause pollution. Wars result from too little energy being devoted to philosophy. Some terrains and creatures will only survive in particular climates. This is because the systems in *SimEarth* are based on the Gaia Theory of evolution proposed by Professor James Lovelock. Regarding the earth as a huge single organism it suggests that creatures and their environments constitute a system which is able to self-regulate climate and atmospheric conditions. But while *SimEarth* can be appreciated as an impressive feat of programming whether it will capture the imagination of the public in quite the way Ocean is predicting is debateable.

Ocean chairman David Ward reckons that *SimEarth* "takes the company to the threshold of being involved in interactive entertainment. It couples the desire to learn with the desire to be entertained, which I think is of fundamental importance to the way this industry will move forward. It also widens the demographic field of the industry. We have in a sense been constrained to make products that appeal to boys between the ages of 8 and 18 which has obviously restricted the nature and genre of what has been published. *SimEarth* appeals on many different levels from children to parents through to students."

So confident is Ocean that *SimEarth* will change the face of entertainment software as we know it that the UK launch was arranged as a major media event. National newspapers were invited, along with a few other surprising non-computer publications including *The Face* and *Arena*. Unfortunately none of the nationals turned up due to "developments in the Gulf", but the man from *Arena* seemed most impressed.

But *SimEarth* does not have quite the appeal of *SimCity* and despite claims that it is primarily an entertainment product, it is complex and even developer Maxis admits it takes at least an hour of browsing through the manual before you can embark on planet management with any confidence. The program is hardly a game and to play it properly means constant reference to the text book-like manual.

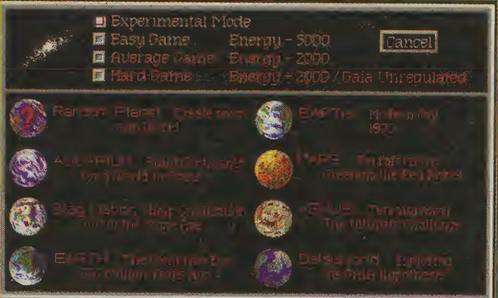
The graphics are fairly basic; as exciting as battles between dinosaurs and birds might sound their visual representation is fairly mundane. Unlike *SimCity*, you never feel quite in control – evolution seems to take place whatever, and you are reduced to trying out endless 'what if' scenarios. So since *SimEarth* is unlikely to appeal to the usual entertainment software buyer – those boys from "8 to 18" – the program's success will rely on selling it to a new market. Perhaps *Arena* might convince a few yuppies that *SimEarth* will satisy their power lust, but who else it might appeal to is unclear.

NEW FORM OF EDUCATION

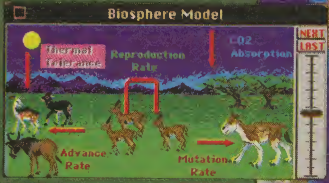
David Ward, though, is confident that software will sell as an educational package: "One of the Great White Hopes of computer software was that it would provide a new form of education and it is a hope that has never been fulfilled. Part of the reason is that educational software has tried to emulate conventional education so that you would have Shakespeare's works on the Acorn, or whatever. What *SimEarth* does is focus the use of data processing as an educational tool for the first time."

He could be right in this respect. *SimEarth*, with its hefty manual, does come across as an education tool. It might not work in the general market, but its chances in the classroom seem good. The company also reckons *SimEarth* is the program to launch it into a new area of 'serious' entertainment software aimed at the PC market. Says Ward: "We will be developing and publishing sophisticated entertainment products as part of our broadening product strategy. *SimEarth* is the first of five or six this year." In which case, despite all its drawbacks, *SimEarth* should be a success, since it might just encourage other major software houses to be a little more daring and ambitious in their output. ■

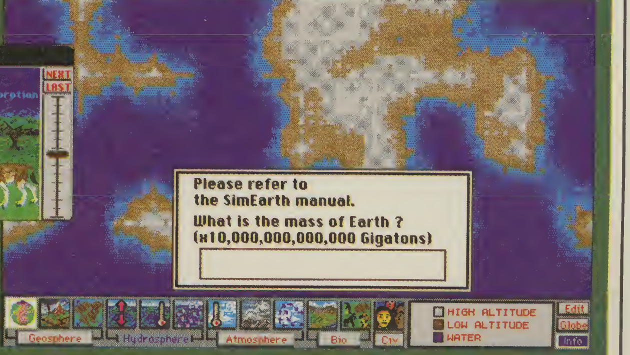
Giving you a God-like view


Experimental Mode
Easy Game Energy - 5000
Average Game Energy - 2000
Hard Game Energy - 2000 / Gaia Unregulated
Cancel
Random Planet
EARTH

• Seven planets to choose from or you acn create your own.



• You can change individual elements in a variety of systems.



Please refer to
the SimEarth manual.
What is the mass of Earth ?
(x10,000,000,000,000 Gigatons)

• The main playing screen is a map of the entire planet.

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Amiga upgrade

I am writing to you with regard to the Amiga column in *Express* 117 in which it was stated that Commodore have no plans to make the new operating system - Kickstart 2 - available to A500 owners.

I phoned Commodore UK (my Amiga is in for repair) and I asked them about upgrading by 2000 to Kickstart 2 and full ECS. I then asked about the possibility of upgrading my A500 as well. I was told that both could be upgraded to version 2 if the computer is sent to them. The computers (A500 included) could be upgraded to full Extended Chipset specification, including 2Mb of chip RAM! Although 1MB would be enough for most people, he said.

Version 5 of the A500 (or later) contains the easiest motherboard to upgrade - just a matter of replacing chips - but earlier revisions involve more drastic measurements. So, it is not as bad as A500 owners – and indeed Jason Holborn – think. No having to put your A500 in on part exchange for an A500P.

By the way, the person I spoke to at Commodore said that Kickstart and ECS would be released, hopefully, in April.

Matthew Treasure, Sherborne, Dorset

Bang to rights

ONE OF HAYDN'S £5 WINNERS

I read with great interest Steve Lee's letter in *Express* 118. Did the offending advert truly slip through the net, or was it more a case of no-one seeing it for the piracy that it was? I ask this, as I believe there is a much wider abuse of copyright show openly throughout your magazine.

I am referring to the use of copyright material in PD demos. Many of these programs contain digitised clips from films and sampled music. Both of these media carry quite explicit copyright warnings which are overlooked by your PD reviewer and editor. These demos also seem to have a habit of appearing before the films are on general video release, so some of them must be made from pirate videos.

Now of course, if these people have the permission of the copyright holders to use this material, I wholeheartedly apologise for any slur on their character. But there's about as much chance of them having this as there is of you sending me ten pounds for this letter.

A Sharp, Driffield, North Humberside

An interesting point that you raise – and you are half right. I'll send you one fiver for your input.

In the strict sense, you are quite right - sampled soundtracks, snatches of music and clips from video films are all the property of the copyright holder. But so far as I know, there hasn't been a case in which anyone has been prosecuted for creating or distributing such material in the Public Domain. It may be that the copyright holders are not aware of the fact that their material is being used in this way, or that they are aware and are not bothered.

For the music industry to get hot under the collar about short samples, given the nature of most of the chart material these days, would be a little hypocritical, to say the least.

Material in such demos is not 'pirated' for commercial gain, and probably serves to promote the original work anyway. Indeed, some software houses have realised that they can get free publicity by 'leaking' graphics or playable sequences onto the pirate circuit. H F-W

Sound and fury

I am a professional musician, currently working for various large software publishers, writing music for their games. I also play in a band in London which will soon be signed to a major record label. Bearing this in mind, I bought *Express* 118 as it had that music supplement.

As I thought, there was no mention of the truth about the home computer music industry. I'd like you and your readers to know a little more...

1) The computer music industry is mainly run by people who don't actually know anything about music and are therefore not really qualified to judge music.

2) Writing music is the least of your worries. Companies usually want to know if you can cover Atari ST, Amiga and PC. Some want C64, Spectrum and Amstrad as well. And the first question they usually ask, before talking about your music, is 'do you have your own music and sound effects drivers for all these formats?'

Not much to ask, is it? For a musician who will know how to program machine code on all these machines!

3) Having got over all these hurdles, companies need pushing. They need constant hassling to find out: a) have they received your demo disk; b) have they listened to it; c) do they like it.

My final gripe, and possibly the most important, is at other computer 'musicians'. Why is there so much crap music in games? I believe it goes back to the non-musical project manager, who likes a demo sent in by some guy and thinks they have found a genius.

Computer games' music is not written by musicians but by programmers, who 'type in hex numbers, assemble and then listen to what it comes out like,' which I quote from a recent meeting with a professional Atari ST 'musician' who does not own or play any musical instruments.

You don't find graphic artists who can't draw on paper, so why use musicians who can't play instruments? Maybe the moral is write something repetitive, slightly out of tune, with poor samples and then people will put it in a game...

Anon, London

Interesting perspective there. According to our illustrious editor, we will be returning to the subject of computer music in a few weeks' time - if anyone else has something to add, drop me a line. H F-W

Ten more things

ONE OF HAYDN'S £5 WINNERS

Here is my top ten list of original, practical uses for your computer or console:

1) ZX Spectrum 48K – remove rubber keys to help solve incorrect homework problems; fill case with water and use as ice cube tray;

2) ZX Spectrum Plus 2 – when building an extension to your house, they come in handy as breeze blocks;

3) CBM Amiga A500 – use the SAY speech command to good use by including it as Kylie Minogue MKII in *Neighbours* (much more intelligent);

4) Atari ST – obtain a nice, jingly PD tune, stick it up on a wall, attach it to the door bell so you get a beepy jingle when someone calls round;

5) Acorn Archimedes – send to Iraq and have Saddam Hussein screaming for mercy as he won't be able to find any software for it;

6) BBC micro – remove all peripherals and use as a door wedge;

7) CBM 64 – add a Quickshot joystick and insert it into the US Space Shuttle as the main computer system (see the film, Space Camp);

8) Atari Lynx – obtain one elephant, train it to sit on your Lynx and you can have the other, streamlined smaller version for free – works better, too;

9) Atari STE – now you can have a jingly doorbell in superb stereo;

10) Sega MegaDrive (Japanese version) – stick slick of bread in cartridge slot, make good toast when power pack blows.

J S Smith, Sheffield

Well, you've probably managed to insult just about every sensitive-minded computer owner under the sun there, JS. But I'm still going to give you a fiver. Keep those lists coming - the best ones are in with a chance of a prize. H F-W

■ More MCIBT

On the 'My Computer Is Better Than Yours' front - my computer is a Ness AT286 called 'Elliott' (geddit?) How about a 'My Computer Has A Stranger Name Than Yours' correspondence for a little while? One of my friends has suggested a 'My Computer Can Emulate More Computers...' debate, and another pal of mine came up with 'My Printer Has Its DIP Switches In A More Stupid Place Than Yours' debate.

Will it never end?

Dr Daoud Gordon, Canvey Island, Essex

Over to you dear readers. There might be the odd fiver on offer for some really good debates - or a convincing explanation of why printer manufacturers hide DIP switches away in the most inaccessible and ergonomically inconvenient place they can find. H F-W

■ Trumpet blowing

A bit rich is it? I write a letter, stating facts, to correct a mistake made by one of your writers and you call it a 'bit rich'.

SAM Computers Ltd are the only people who can authorise the use of the names SAM or SAM Coupé in relation to the SAM Coupé computer. How would *New Computer Express* like it if other people started using its name without permission? Your comments were, to use your own words, a bit rich.

INDUG has been going for nearly four years, and I agree that we are both Spectrum and SAM Coupé orientated, but a majority of SAM users have come to the machine from a Spectrum background and most still own their Spectrums. As the Coupé can run 98 per cent of software written for the 48K Spectrum, the Spectrum articles we publish in *Format* are still of interest to SAM owners.

We do not seek to stifle support for the SAM, although it is getting a lot already. What my original letter set out to do was to point out that nobody can call themselves 'The SAM Coupé Users Group' with SAM Computers giving consent. Anyone reading the article by Robin Alway could, if they were not aware of the situation, have been misled into thinking this reference was to an official user group – which is not the case.

I hope the above will make our position clear. I thank you for publishing my original letter, but I am afraid I can't thank you for your remarks...

R P Brenchley, Format Publications

Aren't you being just a little bit touchy, RP? The point that I was trying to make was that the people behind the Coupé would be a tad silly to limit user group activity by policing the use of the SAM Coupé name too harshly.

After all, telling people the name of the computer that your user group supports is helpful, and the best place to tell them is in the name of your group! To set the record completely straight, according to Alan Miles, he of Miles and Gordon fame, there is no 'official' user group as such, mainly because the company doesn't want to imply endorsement of any particular group of enthusiasts.

User groups may wish to contact Alan direct, on 0792 700300 and chat about becoming members of Team SAM – an umbrella organisation set up by the company. Membership of Team SAM confers official approval, rather than 'official' status... H F-W

■ Beating the crackers

Piracy - I've heard all the arguments, price (from both sides), quality and the holier than thou attitude adopted by some. I've seen all the comparisons, robbery, muggings and the rest of it and read all of FAST's adverts, but I still have my younger brother telling me that a "friend" at school can get us a copy of some latest game.

I have had many long arguments with him over why we do not want pirated games, it takes a great deal of reason to persuade him to pass off a "free" game, usually ending in an agreement that I will split the price of a new game with him, tough as I like strategy and he likes shoot/beat-'em-up's.

The question that the software industry must address is which type of piracy must it combat – "playground" or serious? From what I know of many poor games people, they only ever play the first couple of levels. I am often satisfied with the free demo that often comes on the front of magazines. If I want more than that I buy the game, a recent example being the Captive demo from *Amiga Format.* In York we are lucky as we have two very good dedicated computer stores which are always more than willing to let you try games before you buy (a quick plug for Yorcom and Microbridge) and I am often glad to do so, it makes you realise just how subjective reviews of games are.

It strikes me that a solution to this problem would be to permit games to be copied however for only the first one or two levels to be useable on the copied version. This would mean that people would not seek out cracked versions and good games would be sending out "tasters" to more people than PD. libraries or magazines could ever reach. However I doubt that software houses would take up this idea as their ability to hype poor games to sell them would be drastically reduced.

Matthew Millar Clifton, York

■ Amiga Essentials?

Through ownership of Acorn Computers and contact with most 8 bits at work and at a computing club I thought I knew most of what I needed to know about computers, but a few hours with an Amiga surprised me. Anyone considering buying one should be warned that they will need a few more purchases:

1) Alarm clock – to wake you up when it is finished loading something from disc. Over one minute to get the workbench is ridiculous (why isn't it in ROM?) and another 30 seconds just to catalogue a disk with icons.

2) Punchbag – something to take out your frustration on as you wrestle with the ridiculously unfriendly BASIC editor - the worst I've seen since the Dragon (yes, that was by Microsoft too).

3) Mirror – to invert your image of the world, as the Amiga BASIC seems to think Y is measured downwards on graphs.

4) Sunglasses – to protect you from the awful flickering mess on screen while some games load.

5) Tranquilisers – to calm the nerves when you think it has died – producing a loading screen and then going back to a blank one seems quite normal for Amiga programs, but unforgivable on any 8-bit machine.

6) Soundproof room – so that the neighbours won't hear your screams when it crashes yet again and you have to go back to Workbench. While looking at PD disks supplied by friends (ex-friends?) I reckon it crashed about once every two minutes

John Goldsmith, Bury St. Edmunds, Suffolk

Well John, I reckon you've assured yourself some lengthy correspondence in our letters pages there. I think you'll end up needing more armour than Saddam's Republican Guards! HF-W

■ Twin geeks

After reading the delightful letter written by one of our dear friends, Marc Broster (*Express* 119), we were compelled to write this letter to correct a few minor mistakes:

1) Marc suggested that machine code programming is easy but we know otherwise, real programmers don't use ROM routines as they advertise in their demos.

2) Alright the SAM (don't swear please!) has some cheap games but this price difference is reflected in the quality. On the Cover disk 9 of *Amiga Format* I (David) got a demo of Pipe Mania, this is many times better than the SAM complete game!

3) Who is D Gommeren and what about the Digital Concert music on the Amiga?

4) Who's got themselves into a bit of a muddle then? MasterSound is a sampler not a MIDI program and I (David) got my copy for £30. We think the software you are talking about is MusicX, undoubtedly the best piece of music software available to the average user.

5) Ah! We agree with you, Marc. The graphics on Flash! are not up to the standards of the Amiga.

6) Good idea! I (David) paid £30 for my copy of MasterSound.

7) Spend £40 on a 1/4 meg upgrade! Yes, you're right it is a rip off. I (Chris) bought a 1 meg upgrade for my Archie 410/1 for £45 including VAT.

8) Is it worth spending over £200 on a printer which you are going to connect to a rather expensive dashboard? (SAM Coupe)

We apologise if we start a 'my computer is better than your dashboar debate' (MCIBTYDD)!

Chris Watana and David Murday, Gainsborough, Lincs

AS SEEN ON SCREEN

SPECIAL

■ Amiga

Sunday Evening - BBC 2 *The Money Programme* on the topic of IBM losing its grip on the personal computer market - an Amiga 2500 was shown running the 'Newtek' OEMO and its ability to compete with IBM and compatibles discussed in an American computer store!!

Phil White, Walsall, West Midlands

■ Atari ST

I recently saw an Atari ST in use on Reportage on Channel Two (6/2/91) by a school computer department. Why can't more schools use common sense and use Atari ST's? A far superior and cheaper machine than some others I could mention!

Steven Edgar, Esiels, Peebles

■ Apple 2, PCW, PC

The recent 'First Tuesday' documentary on 'Toxic Oil Syndrome' (or 'Attack of the Killer Tomatoes' as it turned out) provided a field day for computer watchers.

One Spanish laboratory featured an Apple 2 and a PC of some kind, while another had an Amstrad PCW8512 and a hulking great beast of an AT contemptible, on which we even glimpsed a highly indented program, language unknown.

John Goldsmith,Suffolk

■ Mega ST

I've actually seen a MEGA ST on television! It was in the school science lab in the program "PARKER LEWIS CAN'T LOSE" which is shown on SKY television.

This is an American series, so it is unusual to say the least for a MEGA ST to be used rather than a PC or an Apple MAC.

Clive Parker, Pill, Bristol

■ Err ...Nintendo?

I spotted two Nintendo consoles on *Tomorrow's World* last Thursday (14 February). And did you know that two Amigas (an A1000 and an A2000) are used to generate the graphics and animations used on *The Chart Show* and *Star Test.*. I know this because my brother used to work for the company that made the graphics (and edited the shows). Oh, and I have never assumed that I'd get a fiver for every bit of drivel I send to you. It's not that I don't want a fiver though....

Dan (The Man) Walker,Reigate, Surrey

Sorry Dan, those Nintendos were in fact Sega Megadrives running Space Harrier II so even though you'd quite like a fiver, I can't give you one. How about £2.50 for being half right?

As I'm feeling generous, the rest of you can all have a fiver. Well done. H F-W

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Macintosh

NOTEBOOK RUMOURS

Presumably you checked out the cover story in last week's *Express*, concerning the projected new Macintosh portables (a cover story cribbed from this column, incidentally, which means that I've had to rewrite it!).

Apple is certainly trying to make up for the less-than-totally impressive first incarnation of the Mac Portable. Although it's still the sexiest portable on the market, and I'd sell my soul for one, it must be said that it did have some limitations – amongst them the fact that purchasers received a free hernia and duffing up from the bank manager with every machine.

Still, with the new versions projected to start at about $2,500 – which will probably translate to around £2,200 or so – a good many more of us might actually be able to think slightly more seriously about a Mac to go. (Well, not that seriously – they don't pay *that* well at Future Towers...) And the reduction of weight from 14 to seven pounds means that you'll no longer be able to spot Mac Portable owners by the fact that one arm is five inches longer than the other.

CLONE WARS

The other major news about the Mac over the last couple of weeks has been this week's story about Californian-based NuTek Computers producing the building blocks for Macintosh clones. Because the company produced the hardware and software in a 'clean room' environment – documenting all development work and only using publicly-available information about the Mac's workings – it should, theoretically, be free from any law suits from Apple. But anyone who believes that needs their head examining; there's no way that Apple will allow anyone to copy the Macintosh without a long and costly court battle.

FREE CD-ROM?

If you're feeling loaded, and you want some PostScript fonts, you might also be able to get yourself a free CD-ROM player. That's the offer being made by Agfa, which is offering the free drive if you buy five font libraries from their collection. Pay £950, buy five libraries (which could be worth up to £1,500, if you want the most expensive five in the collection) and receive CD-ROM player.

You get a font CD which contains the whole Agfa type library, and codes which let you access the five libraries that you want. Thereafter, you can obtain any other Agfa fonts just by phoning the company for an access code (and telling them the number of your flexible friend, of course). Those with cash to spare should give Agfa a call on 0937 61944.

DEAD CHEAP, DEAD GOOD

Those among you who are considering branching out into comms (yes, I know I keep saying I'll talk about it in detail, and I will, honest, sometime...) could do worse than take a butcher's at the Global Village Teleport Modem which is on sale from Computers Unlimited for a paltry £179.

OK, £179's not that paltry, but it suddenly begins to seem so when you consider that the modem is a 2400 baud jobby, with MNP5. And, even better, another £40 will buy you the software to enable you to use it as a send-only fax machine.

The modem works through the ADB port (the one you plug your keyboard and mouse into) rather than the standard modem port, and so comes with some freaky software to make it all work. Incidentally, those with the new Macs with only one ADB port needn't worry – the modem lead comes with a splitter which allows you to use it at the same time as your keyboard!

Even though it works in a non-

POSTCARD FROM AMERICA

The warm glow of the Macworld Expo is still burning hot in local bio-RAM. Now all we have to do is figure out how to pay for everything. Perhaps the State lottery?

The best hardware hack at the show was the TokaMac upgrade board for the Mac LC by Fusion Data Systems. It's a 68040 accelerator running at 15 MIPs that plugs into the Processor Direct slot. For only $3,000, the board makes the LC faster than the Mac IIfx.

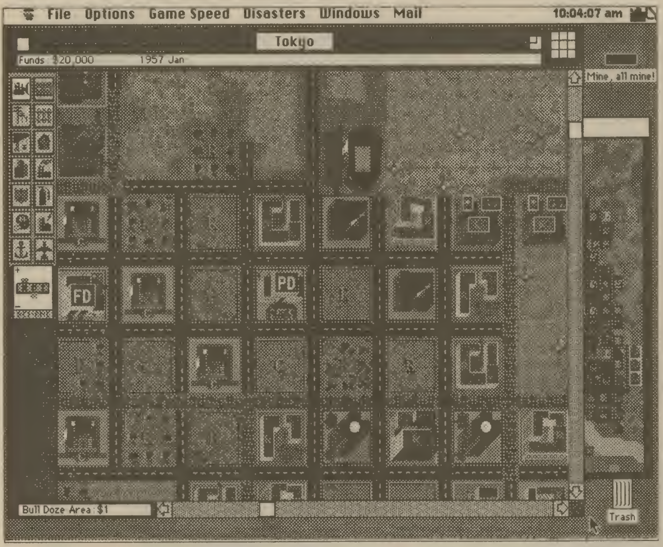
A number of companies that hoped to come out with an LC-based '040 upgrade were caught without a product. The project engineers at DayStar left town to start their own upgrade company. Everyone wants to get the pizza-box Mac cooking!

Some sceptics think that the new product is more like the oven than the cake. The marketing representatives at Total Systems, with a line of 68030 boards, claimed that TokaMac was "irresponsible" to sell the product. They claimed that the '040 runs too hot for the under-powered LC power supply. Fusion engineers replied that the Direct slot is set for 4 watts, and their board comes in around 3.82 when the 68040 is running in the small buffer mode. They added that the Apple Mac LC product manager had blessed the card. He had come by the booth and anointed them with scarce LC video-RAM.

Health and safety was addressed by a number of vendors. There were different kinds of cheap foam wrist rests that are placed in front of the keyboard while representing the more expensive side of ergonomic aids was the $250 ErgoArm device at the MacStation booth. It is a fully articulate arm-support, made from plastic and metal, that clamps onto the desk in front of your computer.

Elf Armor by Fairfield Engineering seems to reduce ELF (Extremely Low Frequency) magnetic emissions in compact Macs fairly successfully. These emissions may cause cell mutation and cancer in computer users. The $80 device is a metal tube that fits around the rear of the video monitor. The company will be coming out with a product for Apple 13 inch colour monitors.

David Morgenstern



• *Sim City: Capitalists love it, socialists become capitalists when they play it.*

standard manner, I've had no problems using it with a range of comms software, from *MicroPhone II* through to *AppleLink*, and its price means that it's certainly the one I'd buy for myself (unless I could afford to fork out £1,000 or so for a 9600 baud piece of kit). If you're modem shopping, check it out – Computers Unlimited can be reached on 081 200 8282.

Oh, for those who are concerned about such things, it doesn't yet have BABT approval for connection to the British Telecom network. In other words, you don't get a natty little green sticker on the box...

DIY CAPITALISM

Yes, it's been around for a while now, but for those with no interest in the world around them I thought I'd mention that *Sim City* is one of the best games available for the Macintosh.

For those who don't know, the idea is that you start with an area of jungle and a budget of $20,000, and try to build up a working city. Building things like roads, residential areas, factories and so on all costs money, and as soon as people move in to your village they start complaining – about taxes, the crime rate, housing costs, pollution and so on.

The idea is for you to design your village (which grows into a town, then a city, then a metropolis, then...) in such a way that this whinging is kept to a minimum.

It's incredibly addictive, and has the ability to change the views of even the most ardent left-winger. To hear a committed socialist mutter, "Sod them. I'll bulldoze three blocks of flats and increase taxes – that'll drive the poor people out" is truly an eye-opener!

Sim City costs £32 for the black-and-white version, £52 for the colour, and should be available from most stockists of Macintosh games. Check that it will run on your model of Mac before you buy it (the colour version that I tried wouldn't run on a IIsi).

And just out this very week is the sequel, *SimEarth*. For a low down turn to page 10.

Ian Wrigley

PC

A CHEERY WAVE

WAVE, up in sunny Barrow-in-Furness, is always finding little bargains with which to tempt Amstrad owners, and the latest offering is a joystick/software pack. For £14.99 (plus £4.60 P & P), you get:

A JY2 joystick
3 blank 3-inch Amsoft disks
A 'business program' worth £49
A disk containing six games – *Doors of Doom, Roland in Time, Shape and Sound, Tubaruba, The Prize* and *Qabblaah*.

For all the latest details, give WAVE a call on 0229 870000. Alternatively, you can write to: WAVE, 1 Buccleuch Street, Barrow-in-Furness, Cumbria LA14 1SR.

Incidentally, the company is also now offering its entire price list on disk! It takes up some 27 pages of A4 in printed form, but WAVE will send you a floppy containing the whole lot for just £1.90 – not bad when you consider you get a blank disk at the end of it.

COMPILATION CRAZY!

It's traditional around this time of year for software houses to trot out their compilations (well, from Christmas onwards, anyway), but it's not usual to get 10 games in one package!

But that's just what you get with Gremlin's 10 Pack. You get two disks for your money, and between them they contain the following:

- *Skate Crazy* – a colourful little roller-skating game where you have to avoid various obstacles like traffic cones and tyres. It's simple fun, but enjoyable.
- *Road Runner* – based on the antics of those cartoon favourites Wile E.Coyote and the Road Runner. You play the part of the fleet-footed bird, and have to avoid your arch-enemy while gobbling birdseed and keeping away from his traps. Great fun.

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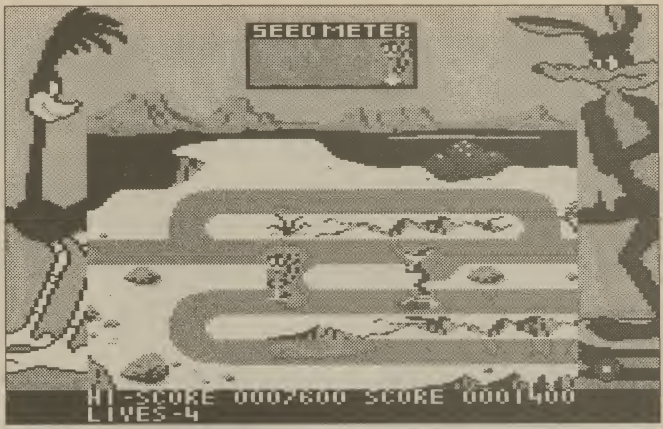


• Road Runner *captures all the crazy cartoon fun of the original TV show.*

- ● *Butcher Hill* – a typical Vietnam-type blast. It's colourful, but the graphics are very slow and jerky, and there's not much here to appeal to modern gamesters.
- ● *Dark Fusion* – a kind of platform shoot-em-up game with loads of extra weapons to pick up and aliens to kill. That's about all there is to it, though. Competent, but fairly dull.
- ● *Street Fighter* – is a martial arts kick-em-up where you visit five different countries and fight two vicious villains in each one. It's a bit slow, and a bit easy, but it looks nice.
- ● *Side Arms* – an outrageous orgy of destruction. There are simply oodles of extra weapons for your hero to collect while zooming about on his jet-pack and tons of vicious, marauding aliens to blast into smithereens. Almost completely mindless, but terrific fun.
- ● *Super Scramble Simulator* – an unassuming little game where you must guide your off-road motorcycle over various obstacles. However, you also have to work the gears, and pick just the right speed... actually, it's an excellent little game.
- ● *Footballer of the Year 2* – oh no, another text-only football management simulator. Need I say more?
- ● *Gary Lineker's Hot Shots* – rather better. You view the on-pitch action from above, and control follows the usual pattern of automatically selecting the player nearest the ball. The scrolling is a bit jerky, and it's not in the same league (ho ho!) as *Kick Off II* or *Italia '90*, but it's still pretty good nonetheless.
- ● *HATE* – a pretty blatant Speccy port, but it plays OK nonetheless. It's a rather unusual diagonally-scrolling isometric 3D shoot-'em-up where you zoom along... er... killing things.

None of them are terribly impressive by modern standards, but, with a couple of exceptions, they're all decent games.

Best news of all, though is the compilation's price – £12.99 on tape, £17.99 on disk. Even on disk, these games are cost only £1.80 each – you can't get a budget game for that, even on tape!

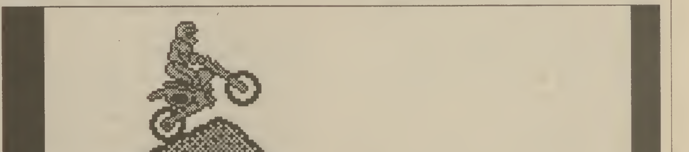
IS THIS MAN A GENIUS?

"Please, please, please..." goes Paul S Hinchcliff of Ipswich, "...please tell me no-one has come up with this idea before. On the back of my 6128, the edge connectors are nearly all worn out, due to the plugging in and unplugging of printer leads, expansions, disk drive leads etc. If you could build a small 'cover' to slip over the edge connector, then it would not be worn away, and you would not have to have it repaired. Please tell me if you think this is a good idea, as I am taking it seriously."

Hmm... er, yes... well... I suppose it is a good idea really, as the edge connector on the back of the CPC is a bit grotty. But then our office machines have stood up to about five years of plugging and unplugging, and they're all fine – you must be a bit rough, Paul!

The other thing is that lots of plug-in peripherals for the CPC have a straight-through connector built in. Why don't you just leave one of these plugged in and wear the connector out, and not your CPC's main circuit board?

No? Well, all I can suggest, Paul, is that you have a go at making up your own edge connector 'cover'. If I'm wrong, and people really are interested, you might make yourself a millionaire! (If you do, don't forget your mates... come on, I did give you the idea...)



• Super Scramble Simulator *has bare, but nicely-detailed graphics and is rather good.*

FIGHTER BOMBER HELP

Are you having trouble with this rather excellent Activision game. That's probably because your instructions are missing some rather important key commands. However, Jamie Murray and David Clayton have come to the rescue:

F0	External views
Q,A,O,P	alters the views whilst in external mode
Z and X	Zoom in and out
F1	Pilot view
R	Alters radar range (ie 1,3,6,12,25)
F4	Control Tower view
N	Move to next target HDG and RGE and No (Also airbase info once targets cycled through)
F8	View plane from above (zoom also)
F9	View plane from rear (zoom also)
F7,F5,F6	Right, rear, and left cockpit view
C	Release Chaff
F	Release Flare
H	Pause / Unpause

Rod Lawton

Amiga

TIME AT THE BAR

You've all heard of executing commands by clicking on icons. You may have even seen touch screen systems where the user simply presses a fleshy digit against a monitor screen to carry out a particular operation. But how many times have you seen a barcode operated Amiga?

Believe it or not (you doubt me?), this is exactly what US-based MegaGEM has come up with. It has just announced the impending release of its new 'BarPro' system which, as the name suggests, is a barcode reading system for the Amiga.

The system includes a mains-powered bar code reader that plugs into the serial port of the Amiga. When used in conjunction with the accompanying software, this magical device will happily read a number of different barcode formats, including UPC, EAN, MSI and CodeBar formats. Just think, with all these different formats you can probably even read the barcode on the front cover of *Express*!

BarPro's software also allows you to create your own barcodes which can be printed out or saved in IFF format. Most exciting of all, though, is that you can create barcodes that execute commands of your choice. Once the barcode driver software is installed, you can execute a CLI command just by dragging the barcode reader across your barcodes. Now that's what I call smart!

BarPro costs a rather gross $900 in the States. Those of you with more money than sense can find out more by calling 0101 805 3481104.

PORTABLE DIES

According to a source close to the pioneering German hardware developer Gigatron, it seems that the company's much talked-about portable Amiga, the Journey Man, may now never see the light of day.

When I spoke to my source, he exclusively revealed that Gigatron had stopped development of the Journey Man portable despite considerable interest throughout the Amiga community. Although details remain sketchy, it seems that the company may well have been forced to take its decision after encountering considerable resistance from Commodore who may well themselves develop an 'official' portable sometime in the future (come on Commodore, you know it makes sense!).

Rumour has it that Gigatron has been involved in legal wrangles with Commodore since it announced the development of the Journey Man a couple of years ago.

MARVELS FROM MAST

US-based Memory And Storage Technology (MAST to its friends) is the kind of company that likes to keep itself to itself, but when it does finally produce something, it's almost always one hell of a product.

Its latest range of products is certainly no exception to this rule. First up is MAST's own entry to the ever expanding range of ST Emulators, which they call 'BrainSTorm' (US price $99). Developed exclusively for MAST by its team in Germany, BrainSTorm claims to run approximately 98 per cent of ST software including MIDI programs. According to MAST, the only programs that don't work with BrainSTorm are those that either use ST DMA or program the MFP (I'm not an Atari expert, so don't bother asking me what an MFP is – something to do with floating point numbers perhaps?)

From the limited information available to me at the time of going to press, it seems that MAST even claims that BrainSTorm will run ST games (although copy protection could possibly prove a problem). Because it is both hardware and software-based, the BrainSTorm hardware can both emulate the ST custom chips and even handle address translation.

The speed of emulation certainly seems impressive enough. Although it generally runs slightly slower than a real Atari, MAST claims that certain aspects of BrainSTorm actually run faster thanks to the Amiga's superior hardware. These include text rendering (120 per cent faster) and disk accesses (108 per cent faster).

Next up is MAST's 'fantastically fabulous' (don't blame me,that's how they describe it!) ColorBurst system (US price $500) which has amazed visitors to recent Ami-Expos. By simply plugging ColorBurst between your Amiga RGB connector and your Amiga monitor, you can have up to 16.8 million colours on your Amiga screen. And, because ColorBurst is a true 24-bit RGB device,

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you can independently control the colour of every pixel on the Amiga screen using the bundled software.

MAST believes that ColorBurst has many applications including such high end stuff as professional frame by frame video paintbox, editing and special effects creation. Not only that, but it is also fully genlock-compatible. Best of all is the news that ColorBurst is not only available in NTSC format, but in PAL as well, so us lot on this side of the Atlantic will be able to use it.

As soon as I receive copies of either (or both) of these products, you can expect to see full reviews within the pages of *Express*. In the meantime, more can be gleaned by phoning MAST direct on 0101 702 359 0444.

GETTING TOUCHY

If you're in the market for a touch tablet, then you may well be interested in a new unit released by Centaur Software in the States. The company has just released Maxi-Sketch (at around £375), a touch tablet for the Amiga that claims to offer resolution of up to 1000dpi (dots per inch), which is certainly much higher than the average mouse.

Unlike previous tablets, the Maxi-Sketch doesn't require any software. Instead, it takes advantage of the Amiga's auto-config feature to allow for instant use. The device also includes a number of built in emulations for a variety of well respected tablets including the Summagraphics unit. More details are on the other end of 0101 213 542 2226.

NEW WORD PROCESSOR

The Amiga certainly isn't starved of its fair share of word processors, but how many of them actually work on a basic unexpanded Amiga 500? Even the brilliant *Protext 5* from Arnor needs at least a megabyte, which leaves 512k users a bit lost.

Help is at hand, though. New Horizons Software (of *ProWrite* and *Flow* fame) has released a budget priced word processing system (if you can call £75 budget priced, that is) aimed squarely at those users who haven't quite 'got the power'.

Quick Write employs the same WYSIWYG (What You See Is What You Get) display of its predecessors, but will happily work on a basic Amiga. It's certainly no slouch in the features department either; it offers full mail-merge facilities, a 50,000 word spell checker, macros and even full ARexx compatibility (for 2.0 users).

CLIP FLOP

I must admit that I was very impressed when I read in issue 119 of *Express* that Digigraphic Ltd had launched a range of clip art disks for the Amiga. After all, not all of us are a dab-hand with the old pixels, so clip art is a particularly good idea. But then I saw the price; £15 per disk or £200 for all 25 disks. I'm sure I'm not the only person who almost choked at the price!

Does Digigraphic seriously think Amiga owners are going to pay out almost £200 for a selection of pretty pictures? I could understand such a move from a company more accustomed to the PC and Mac markets,but Digigraphic has been involved with the Amiga since its release. I would have thought that it would have had a pretty good idea of what the punters really want by now!

So give us a break, Digigraphic. Do you seriously think that we are going to fork out £200 for something that can be found in abundance in the PD libraries? I think not.

Jason Holborn

PC

SHELLING OUT

Trying preventing inexperienced users mucking about with a PC is a perennial problem. There are times when you want them to be able to use your machine, or any machine, but not to abuse it. The problem is that even if you run programs from AUTOEXEC.BAT or from a batch menu (even a really good one) it's usually possible for them to break out of it and get back to the system prompt. Once there they're outside your control.

However, there is a way around the problem. The trick involves the SHELL command in CONFIG.SYS. This command is usually used for nothing other than telling MS-DOS that you keep your COMMAND.COM in a sub-directory, like so:

```
SHELL=C:DOS\COMMAND.COM /P
/E512
```

The last two switches tell COMMAND.COM to remain resident (not to allow you to EXIT from it) and to set the environment to 512 bytes (in v3.3 and above). But there is a little used switch, /C. This allows you to run a program or batch file other than AUTOEXEC.BAT straight after CONFIG.SYS. The clever bit is that exiting this program hangs the machine since it also exits the existing version of COMMAND.COM. Have a try at this line in a CONFIG SYS file on a bootable floppy disk:

```
SHELL=A:\COMMAND.COM /C
EDITOR.EXE
```

Make the program EDITOR.EXE anything you like – whatever it is, when it finishes running so does your PC; until you reboot it.

WINDOWS FONTS

Font and printer manufacturers seem to be catching on to Windows 3's handy font management facilities. Once you've told Windows about a font, all Windows applications automatically know about it; there's no individual installation to be done, unlike programs isolated out there in bad old DOS.

One of the latest to upgrade its product is GST, whose type management system Typografica is now compatible with Windows 3.

Typographica is a system similar in concept to Bitstream's Fontware. The package comes with set of outline fonts and a control program which uses them to generate screen fonts of the sizes you require. It also makes appropriate printer fonts, either for a dot-matrix or Hewlett-Packard soft fonts. Typografica automatically makes the necessary changes to the WIN.INI file for the fonts to be visible.

Unfortunately the package is beginning to look pretty rusty, with alternatives like SuperPrint or Adobe Type Manager offering considerably more flexibility without the installation hassles. However Typografica is cheap (£59 for the basic set up of Times, Helvetica, Courier and Symbol, £29 for each face thereafter) and works with many non-Windows applications too, including *WordPerfect*.

For more info on Typografica, contact the distributor Electric distribution, on 0480 496666.

MORE FONTS

On the same subject, Hewlett Packard itself has just released a new Windows printer driver for its DeskJet 500 ink-jet printer. It incorporates Compugraphic scalable fonts (Times, Univers and Courier) and over 90 faces are available. The driver is shipping with the £599 printer, but if you already have a DeskJet phone Hewlett Packard on 0344 369369.

DEAD DISKS

Have your disks dropped dead? Would you like to know how to revive them? Then pop along to one of the data recovery seminars held regularly by IIR Technology. The next one will take place on March 12/13 in Dublin, with the following one on March 18/19 in London. Others are due to be held in Manchester and Glasgow.

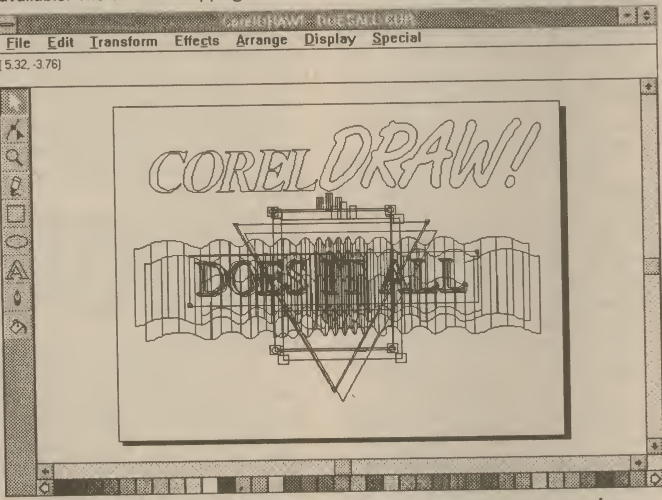
IIR promises that you will hear about viruses, worms, hard disk defects, tracks, sectors, file allocation tables and the rest. If that sounds like your bag, you can register by calling 071-582 1499.

It costs a steep £599, but if you can persuade the boss that the data on your hard disk is worth more than that, it might be worth the trip.

COREL ISLAND

A teaser this week: what's the most sophisticated drawing package on the PC? What program has just come out in version 2? And what program will be reviewed in next week's PC column. The picture below might just give you a very big clue.

Stuart Anderton and Steve Patient



• *Drawing closer: bet you can't guess what we're going to be reviewing next week.*

64

STILL BOARD

Programmers 221B, the team working on MB's *Heroquest* for Gremlin, has just about finished its translation of 1989's best selling game. It's commonly referred to as a roleplaying game; it isn't but it has enough roleplaying elements for the description to have some merit.

In the original, four hopeful adventurers would take up the mantle of traditional swords and sorcery types (wizards, fighters, dwarfs and elves) to explore a dungeon network designed on a grid-like board by an 'evil' fifth player. This fifth player could decide which rooms would be used, where doors would lead, what would be behind them, and so on.

Now the computer takes on these tasks. As I understand it, there can be up to four players and a single player can, if he so chooses, run all four adventurers. The view of play is constructed in isometric 3D form, to the scale of the original board game.

Two things made the original game a success. One was the simplicity of the combat system, which made for an exciting hour and a half of goblin bashing. The other was the appeal of the game's high quality playing pieces. In the computer version, dice rolling has been replaced by animated sequences which play out hits and misses, according to the original rules.

As for the graphics, 221B seems to have done a fine job. The monsters'

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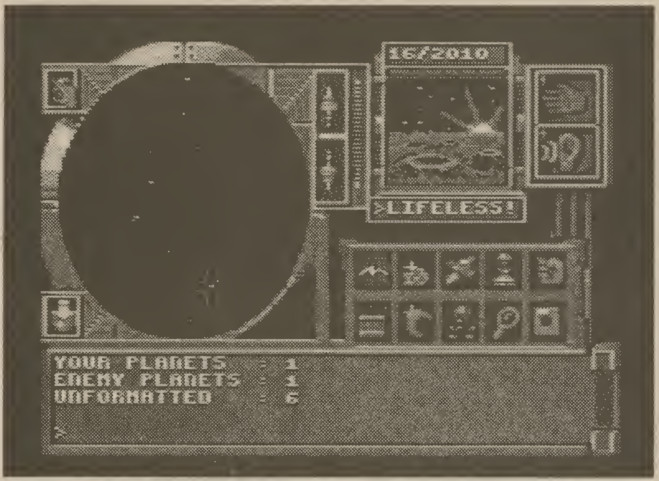


• Supremacy is one of the few so-called strategy orientated games that actually need some input from the brain department.

appearances are uncannily like the Citadel Miniatures on which they're based.

Heroquest should appear in the shops sometime around the beginning of April.

SUPREME JOY

People use the word strategy without thinking what it means, especially if they're people from a software house desperate for an engaging word or two to describe their latest product. Strategy rarely means anything more than the need to realise that large green, mean looking sprites haven't got your best interests at heart.

Well *Supremacy*, one of last year's Amiga triumphs, is truly a strategy game and it's just been converted to run on the Amiga's humble 8-bit ancestor. Unlike the recently-released *Star Control*, which had to have most of the meat taken out of it before Accolade could make it fit, *Supremacy* has successfully been converted with a minimal loss of the original's finesse.

Supremacy is a science fiction domination game played solely against the computer. Its universe consists of four planetary systems. The first one you encounter is a simple eight-world system, but the others become increasingly complex and densely populated as the game progresses.

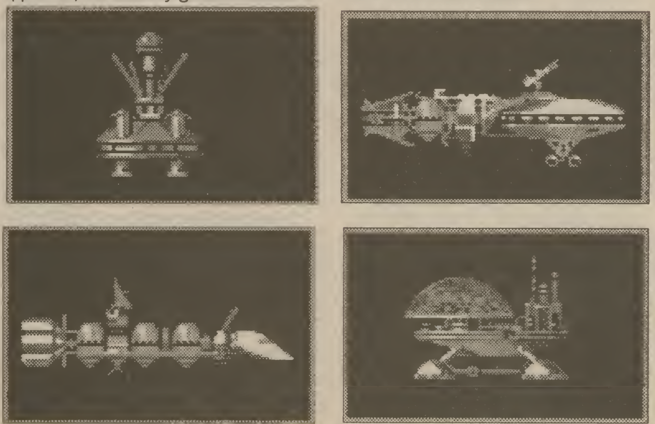
In each of these four systems there is an opponent. These too are arranged in order of ferocity and cunning. For instance, Wotok, your first adversary, is not a brilliant strategist. He will attack when and where he can, without much planning, whereas Krart, your third opponent, deliberately goes for those worlds which are of most use to you, because if he captures them, they will be of most use to him.

At the beginning of a game you and your opponent occupy one world each at opposite ends of the planetary system. You must earn revenue from your population and build farming, mining and solar energy facilities in order to secure your people's survival. Before long you will have the opportunity to build an atmosphere processor. This can be sent on a grand tour of vacant, unexploited worlds and the processor will terraform them into places fit for colonisation. Gradually, you will be able to establish colonies on these nearby planets not unlike the one with which you started.

However, you and your opponent are at constant loggerheads and there's no room for negotiations. The moment you reach into space, the other guy will tell you that the planets are his. You see things differently.

You can train armies recruited from your worlds' populations, form them into platoons and equip them with arms of increasing destructive power. These platoons can be sent on battleships to attack the enemy. In combat, you can instruct them to fight with varying degrees of aggression.

Most procedures in a game of *Supremacy* are automatic. You can initiate them or stop them but other than that, no intervention is required on your part. All of the game's functions are icon driven and can be accessed from one of around 10 major screens. Apart from a master control screen, there are also shortcuts available between certain screens.



• Some of the craft used in Supremacy: in a clockwise direction they are an atmosphere processor, a battleship, a farm station and a cargo ship.

There's even more to *Supremacy* than all this: random events create the illusion of a real environment; scientists make breakthroughs that double food production; interplanetary magnetic storms affect equipment. And once you have a few worlds under your control, time and resource management become crucial. But it's all elegantly easy to use.

The game is loaded from a single swipe of the disk. After that, you can leave your save game disk in the drive (and use it regularly). The game is accompanied by a wealth of attractive graphics and some of the most atmospheric sounds you'll ever hear your SID chip sing.

There would have been enough challenge and entertainment without the grief provided by those four aliens. But with them *Supremacy* is guaranteed to test you to the limit.

Sean Masterson

Spectrum

MAKING BEAUTIFUL MUSIC

One of the most accomplished pieces of serious Speccy software for aeons is Gary Rowlands' excellent Music Writer utility. This has been wowing muso types and coaxing unbelievably good tunes from deep within the Spectrum's psyche for some time now.

However, I'm dismayed to see that sales for the utility have dropped sharply of late and plummeted to such dismal depths that Gary has decided to stop selling his professional quality package by mail order.

Luckily for musical people who haven't invested in a copy yet the program hasn't been completely retired. In fact it's now more widely available than ever before with companies like Rikitt Educational Media (Ilton, Ilminster, Somerset TA19 9BR.) and our old friend Garner Designs (57 Lovers Walk, Dunstable, Bedfordshire LU5 4BG.) now stocking the utility.

Another sales-boosting attempt is the introduction of a low cost Muso's Edition which I've told you about before. For £15 plus postage it leaves out a lot of the surplus documentation that talented musos can do without. The reference edition costs £25 plus postage and comes complete with a manual explaining music notation and a snazzy presentation ring binder.

For more information write (but don't order a copy from) G. Rowland, PO Box 49, Dagenham RM9 5NY.

A NEW DIMENSION TO TETRIS

Oh goodie. The sequel to *Tetris* is on its way from Infogrames. *Welltris* is apparently a novel twist on the original, made even more blooming difficult by being in 3D.

You watch the shapes fall down from above, the idea being to rearrange them before they hit the floor. My brain hurts just thinking about it.

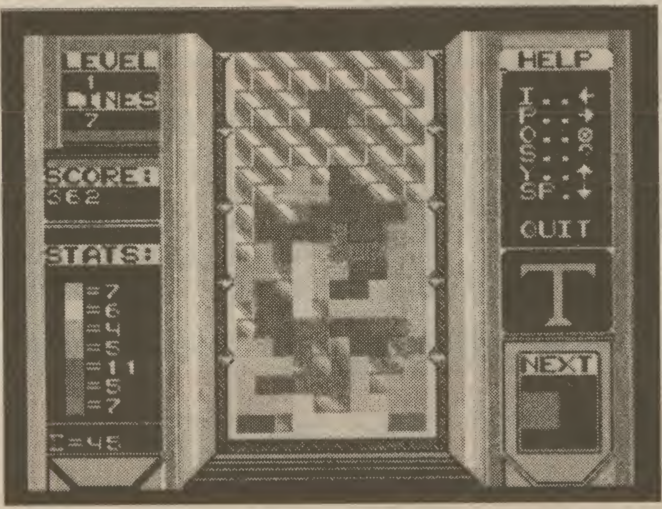
SAM PROGRAMMING

I'm getting a fair amount of Coupé feedback and news already this year which has to be a damn good thing. Lets hope our pal SAM goes on to great things. Anyway, I've just received a letter from Nigel Kettlewell of Dorset. in which he includes a well informed mini-review of MASTERDOS which I'd like to share with you. Take it away Nigel...

"I have just bought MASTERDOS direct from SAMCO, and it is a huge improvement on the original SAMDOS 2. Features include subdirectories, up to five separate RAM disks – which default to the 1Mb memory upgrade if it is fitted (but it costs £80) – a disk copier routine to cut down on disk swaps (ie not file by file copying), and OPENTYPE files which are far more sophisticated than those used by the ZX Microdrive.

"You can also name all your disks, date-stamp individual files and change the number of files available on disk from 80 (except it is usually 78 using MASTERDOS) to any ridiculously high number by setting the number of tracks used for the directory. You cannot, however, set it below 4 (the default with both SAMDOS and MASTERDOS) to gain extra space for data storage.

"There are also additional commands such as DSTAT (a,b), →



• Remember this old 'flat' version of Tetris. *Imagine it in 3D and you've got* Welltris.

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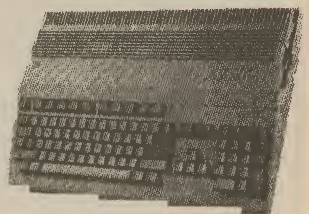

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which gives information on the status of drive a – such as free space, write protect status and the number of files on the disk – and FSTAT ("file name",b), which gives information such as file type or length of a specified file.

"The READ AT and WRITE AT commands have also been improved. You can read blocks of sectors from a starting point anywhere on the disk into any area of memory (in SAMDOS you could only read individual sectors into an address below 65536). I highly recommend this DOS to anyone who owns a SAM Coupé. It has made my life far easier when programming."

Pretty complementary eh? MASTERDOS costs £14.99 from SAMCO, Lakeside, Phoenix Way, Swansea Enterprise Park, Swansea. SA7 9EH.

FILES AND PIPES

Clever bloke that he is, Nigel has also coded a few programs of his own.

The first is a file selector for SAMDOS files (with a MASTERDOS version to follow soon). Apparently it checks the status of each file in a similar way that the MASTERDOS file status commands do. With it you can get info on file length and start position plus the autorun line and address for machine code.

Nigel tells me it can hide, protect, erase and recover files. The sector clash feature means you can check that no sectors have been overwritten since files were erased and therefore check whether the file is recoverable or not.

The *SAM file Selector V1.0* is menu driven throughout and available on 3.5" disk only.

Nigel's other program is a public domain number called *Pipeology* and is apparently all about the science of pipes. I haven't seen it yet, but the whole thing sounds suspiciously like *Pipe Mania*.

With both of the above comes a freebie disk copier routine, font designer and graphics demo. The prices are lovely and cheap at £2.50 each or £2 plus blank disk or £4.50 for both or £4 plus a blank for both. Got that? Write to Nigel Kettlewell at 12 Limited Road, Moordown, Bournemouth, Dorset. BH9 1SS.

SOME SERIOUS SHOPPING

If the combined effect of Christmas, New Year, Valentines Day and Save the Gerbil Week hasn't completely decimated your wallet the next All Formats Computer Fair is bound to. The 'plush' interior of the New Horticultural Hall in Westminster will once again be host to loads of computer bargains stuff and rampaging hordes of bargain hunting punters on the March 23.

As well as all the cheapies the SAM and Speccy will doubtless be well represented by a host of user groups, fanzines and public domain libraries taking advantage of the £75 stand price. Oil your wallet and get rid of the moths by getting hold of an advance ticket from John Riding on 0225 368100.

Robin Alway

ST

RETOUCHE SOMEONE

A month ago I mentioned a stunning new package for the ST called *Retouche*. The program is a digital retouching package which is crammed full of very professional features. Copycare, the British distributor of *Retouche* has just informed me that there will be a full colour version arriving from Germany in a months time.

Retouche Colour Professional offers all the functions of its monochrome brother along with full colour separation. The program includes some sophisticated rastering functions which mean that very high quality output of digitised images can be obtained. The program is the only one of its kind that operates on an image using tones. Tools such as the water function demonstrate just how effectively the tone changes occur, with subtle blends possible for the first time.

Retouche and *Retouche Professional* will be ready for shipping by the time you read this. *Retouche Colour Professional* will be shipping in about six weeks time. Copycare Services is on 081 679 7307.

FLY CONCORDE

Full Circle Technologies has improved on its range of PC emulators. The company is now selling a package which goes by the name of Concorde Plus and comprises the AtOnce AT emulator board from Vortex in Germany.

AtOnce has recently been updated to version 3.5. It offers emulation up to VGA resolution and compatibility with software right across the PC range. The running speed of the board has been improved and is now at 1.08 MIPS (erm, that's millions of instructions per second if you never did a degree in computer science) which is faster than any other PC emulator.

Full Circle is running an introductory offer on the new package. Concorde Plus with a half meg upgrade costs £285, with a second floppy drive it costs £275, with the RAM upgrade and the second drive it costs £329, with MS DOS 3.3 it costs £259, with a 40Mb vortex DataJet drive it costs £599 and (phew) with a slimline hard drive it can be yours for £535.

MORE MIDI MUSIC

The MIDI sequences market seems to have taken off, with a new company entering the foray. Zone Distribution has imported over 1000 MIDI song files from the States covering a wide variety of musical styles. You can run these from within a sequencing program and

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then output the sounds to a synthesiser.

The MIDI files can provide some very interesting insights into the way that songs are constructed. In fact it makes you realise just how easy it really is. Individual songs can be purchased configured to your MIDI setup, or you can buy song packs comprising hits from either a particular artist or similar artists.

Contact Zone Distribution, 5 Abbeville Road, London, SW4 telephone: 081 766 6564.

STATESIDE SHAREWARE

The shareware market is (I'm reliably informed) booming in the states. Shareware is like public domain software, except that if you use it regularly you're meant to send a donation to the author. Apparently the Americans aren't as good as us at handling guilt and the shareware authors can do very well out of their program, thank you.

One of the largest shareware companies from across the Atlantic is Gemini and it recently sprouted a British subsidiary. Mr Hadi, the manager, informs me that the company has got well over 800 titles available for the ST. It has a free catalogue available to anyone who phones.

Contact Gemini Shareware, 10 Warwick Avenue, Slough, Berkshire, SL2 1DX, telephone 0753 28183.

A REALLY SOUND SAMPLER

Pandaal Marketing has entered the sound sampling market with a new package called DAATAsound. It comprises sampling, editing and sequencing software along with the actual cartridge hardware.

Sample rates are very respectable: 5, 7.5, 10, 15, 20 and 25KHz record and playback speeds are possible. Once a sample has been recorded it can be magnified, faded, echoed, flipped, cut, copied, spliced, pasted, filtered, amplified, soften or compressed. The sampler makes use of the improved hardware in an STE, enabling these lucky owners to change volume, bass and treble of the sample.

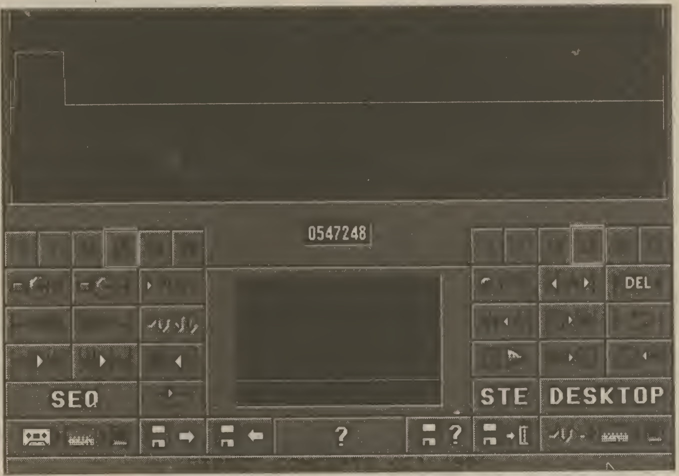
The screen display is uncluttered and well designed, making the whole sampling process relatively painless. Playback is through the TV/monitor unless you have an STE in which case you can plug into the hi-fi.

DAATAsound costs £39.99 and will run on any ST. It's available from Pandaal Marketing Ltd, 44 Singer Way, Woburn Road Industrial Estate, Kempston, Bedford, MK42 7AF, telephone 0234 855666.

RIGHT ROYAL ST

We're all aware of the capabilities of the ST when it comes to music. Therefore it's heartening when you hear about the ST being used in education. The one that's come to my attention lives in the Royal College of Music.

The college uses a Mega ST4 with *Cubase* and *Cubeat* software. In fact one of its budding composers has written an orchestral piece which uses the ST. The piece which is called "Synthesis" was created on the Mega ST using S1000 samples and Yamaha DX voices. Even the orchestral score, for 90 musicians, was printed out using *Cubase*.



• The DAATAsound sound sampler has an uncluttered and well designed screen display making the whole sampling process relatively painless.

The composer, Alastair Bannerman will be giving the piece its first public performance in a concert on March 16 at the RCM. The ST will be used in this production, but whether it will be decked out in a dinner jacket for the occasion has not been confirmed.

NEW NEWS FROM ATARI

I've just received the latest copy of *Atari Reports*, the company's marketing arm's trade blurb, and very interesting reading it makes too. Apparently the company is addressing the problems of STE software incompatibility.

Atari reckons that they're going to be switching advertising to the STE range, which isn't very surprising when you consider the STFM's being phased out. This switch will happen when the Mega STE arrives in this country. Atari says it has briefed software houses about this, so we may finally start seeing some STE orientated games.

Finally, the company is also switching this year's Atari show to Olympia in London.

Andy Hutchinson

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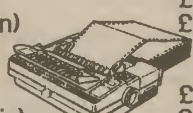

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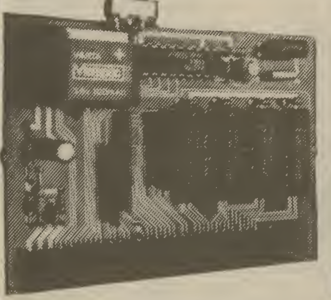

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N.B. : The expansion board requires Kickstart 1.3 to operate - Kickstart 1.3 upgrade available from us for £29.95

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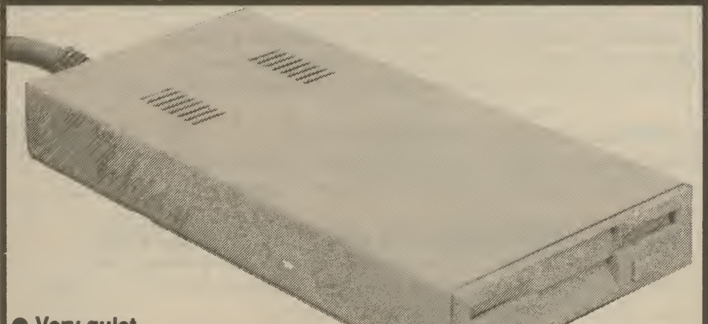

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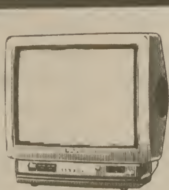

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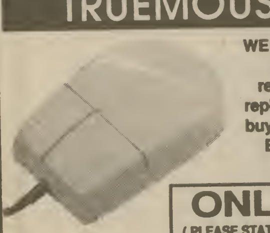

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N.B. Due to the large variance in design of the Atari ST, there is a small minority of boards in existence which may require a little soldering.

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WHOLE WIRED WORLD

Nintendo predicts record breaking sales, Commodore loses court case against ex-boss and much from the man with his finger on the world's pulse, Steve Gold.

COMMODORE LOSES COURT CASE

Thomas Rattigan, Commodore's guiding light of until his ignominious departure in April 1987, has won a long-running legal battle with the company.

The former chief executive officer with the company opted for a trial by jury which voted fully in favour of him when the case came to court recently. Damages have yet to be assessed later but Rattigan is claiming a wallet-busting $9 million.

Commodore moved Rattigan out in April 1987, just a year after making him chief executive officer and only months after giving him a five-year contract for his role in bringing the company back from the brink of bankruptcy.

Rattigan charged in his lawsuit that the company began to lessen his authority in January 1987 and steadily took away his responsibilities until his suspension in April of that year. The lawsuit also claimed that many of Commodore's other top executives were fired at the same time.

CD-ROM DISK OFFER EXTENDED

Hypermedia's CD-ROM disk of the entire Fred Fish PD and shareware software collection for the Amiga has been delayed since I mentioned it in January. Shipment is not now expected until late February and so the company has extended its introductory price offer.

Until the end of March, the CD-ROM disk will cost $50, after which time it will sell for $69.95. As previously reported, the disk contains all 410 shareware/PD disks in the Fred Fish collection.

Contact: Hypermedia Concepts, PO Box 85303, Racine, WI 53408, United States. Tel: 0101-413-632-3766.

NINTENDO CARTRIDGE LICENCES

In a surprise move, Nintendo has licensed four firms to begin producing games cartridges for its colour TV games console. While three companies are in Japan, the fourth, Acclaim Entertainment, is American.

Prior to the move, all Nintendo Entertainment System (NES) software was produced exclusively by Nintendo at its Japanese headquarters.

Many industry watchers say that Nintendo is clearing the way for third-party production of software for its new 16-bit games system, which is scheduled for launch in the spring of this year. Other sources suggest that the Japanese giant may ease up on its rules surrounding the independent production of games cartridges for its various games systems.

POOL OF RADIANCE SEQUEL

California-based SSI has released *Curse of the Zure Bonds*, the sequel to *Pool of Radiance*, a graphical adventure for the Atari ST. The $59.95 game includes more than 24 high-level spells and characters including high priests, lords, paladins, wizards, and so on.

The package is, according to the company, an officially sanctioned advanced *Dungeons & Dragons* game that should make a lot of *D&D* enthusiasts very happy.

Contact: SSI, 675 Almanor Ave. Suite 201, Sunnyvale, CA 94086-2901, United States. Tel: 0101-408-737-6800 Fax: 0101-408-737-6814.

SHOW OFF PROGRAMS FOR ST

Atari US is looking for demonstration packages to work as 'show off' software for the ST. The company is after demos that feature DMA sound, digitised speech and advanced colour graphics that will make people want to use an STE, Mega STE and TT ccmputer.

Submissions become the property of the Atari Corporation with all rights reserved. Judging will by Atari staff members in Sunnyvale, California and all decisions will be final. One winner and two runner-ups will be selected from the files sent in by March 26.

The first prize is a 32MHz, TT030/8-50. The first runner up will win a 16MHz, Mega STE/4-50 and the second runner up prize is a Lynx and 2 Extra Games.

Contact: Atari Corporation Atari Demo Contest, Attention: Bill Rehbock, 1196 Borregas Avenue, Sunnyvale, California 94086.

SWATHE OF TITLES FROM ELECTRONIC ARTS

Electronic Arts has announced a series of new games for the Atari ST, Commodore Amiga and IBM PCs. Some are also being readied for the Commodore C64.

The March launch list includes:

- From Cinemaware, *Air Strike USA*, a combat flight simulator. This timely package combines arcade action and strategy to control the Advance Tactical Fighter II in a variety of intercontinental scenarios. It will retail for $39.95 and be available for Atari ST, IBM, and Amiga.
- The Sega hit, *Golden Axe*, an arcade action adventure in which you challenge the death adder to save the people of Yuria. The package will sell for $49.95 on the Atari ST and Amiga, and for $39.95 on the PC. A C64 version is planned at $34.95.
- *Night Shift*, a toy factory scenario arcade simulation from Lucasfilm Games. The package will cost $39.95 and be available shortly for the Amiga and PC. Atari ST and C64 versions are set to follow.
- *Crackdown* from Sega, which features Dr K's evil cyborgs whose primary aim is to destroy all biological lifeforms. This $49.95 package will be available shortly for the Atari ST and Amiga, with a $39.95 version for the PC and a $34.95 package for the C64 available shortly afterwards.
- *BAT, the Bureau of Astral Troubleshooters* from Ubi Soft. This adventure game allows you to you live out every aspect of life as an agent who can save Terrapolis on the planet of Selnia. There are more than 1,100 places to visited in the game. The package will cost $49.95 for the Atari ST, Amiga and PC versions, and $34.95 for the C64.
- *Dragonlord*, from Cinemaware, a strategic role playing game in which you use dragons as your weapons of combat. Oh, and you need to hatch and raise them too! The package will cost $49.95 for the Atari ST, Amiga and PC.

ATARI NEWSLETTER OFFER

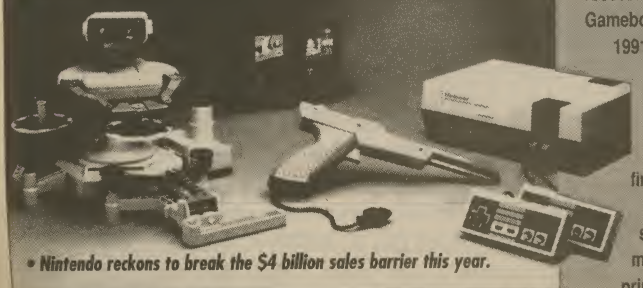
With rising costs and dwindling memberships most clubs are unable to publish or maintain their own newsletter. So more than 14 user groups have clubbed together to produce the monthly *Puget Sound Atari News*.

According to the non profit-making consortium, it is this joint effort that makes the newsletter cost efficient and newsworthy. *PSAN* is looking for more clubs to join in this venture to keep the news flowing and the costs down.

Interested parties should contact Jim Chapman PO Box 110576, Tacoma, Washington 98411-0576, United States. Tel: 0101-206-566-1703. ■

NINTENDO CLAIMS VICTORY IN US

It's barely eight weeks into the new year and Nintendo is already claiming that its games console system is going to be among the biggest sellers of 1991.



• Nintendo reckons to break the $4 billion sales barrier this year.

At a major toy seminar held in New York in recently, Peter Main, Nintendo's marketing vice president, predicted that the company's soon-to-be-released 16-bit video game system will hit sales worth more than $700 million this year. This, coupled with recession-busting sales of the Nintendo games system and the Gameboy hand-held dinkle, suggests that Nintendo will meet its 1991 projections of $4 billion in retail sales.

"Flash results from our key retailers demonstrate that all avenues of our business are on target," Main said. "We sold almost four million units of software for the NES and 300,000 units of NES hardware during the first six weeks of the year.

"Our Gameboy numbers are equally as strong, with sales of 200,000 Gameboy hardware units and almost two million units of Gameboy software. Nintendo is again in a prime position for a record-breaking year," he added.

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117	MORIA RPG
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534	GAMES DISK 1
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1184	MASTERMIND ETC.

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152	QUICK BASE
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1078	ESSENTIAL UTILS 2
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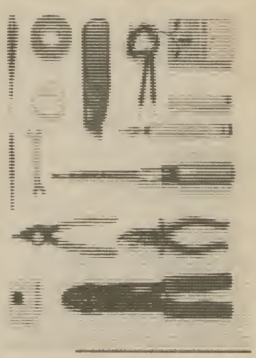


Your computer may be a bit sick and long in the tooth but before it turns up its toes you might be able to save it. Keith Pomfret looked at ten ways to salvation

Computers become obsolete before the salesman's superlatives have had time to dry. A six-month-old machine is no longer state-of-the-art and something approaching a year old can be described as positively senile.

If you've got an old machine, past its first 24 months, but sprightly enough to turn up its nose at early retirement, there are many uses that you can put it to. It's easy to believe the advertising hype and think of a computer as dead because the glossy pamphlets say that you need umpteen zillion mega-flip-flops and only their new baby can do this. That isn't necessarily true. Here are 10 ways to breathe life into the ailing beast.

UPGRADE

The latest 486-based PC with cache memory, VGA display and enough RAM to accommodate the UK's phone books looks like a good prospect, but not everyone needs that sort of power.

If you're very rich and don't mind spending the cash for the sake of having the latest and best machine then that's OK. If like the rest of us, you have a particular job to do with your computer and don't have a bottomless pit of money, read on.

The upgrade path that you follow will depend on your needs. A colleague with an Amstrad 8256 added a hard disk drive, a better printer and some bank switching software and turned the basic text engine into a pseudo multi-tasking document processor, terminal and database. A basic PC can benefit from a hard drive and display adapter and in many cases even a little extra memory will save the day.

NEW MODEL

If your computer has really reached the end of its useful life, think about using its components to enhance the new model. When an office Apricot was due for replacement, the dealer curled his lip and turned up his nose at the thought of a trade in. "No call for it," he said, and offered what he called a generous £20 to take it off our hands. The Apricot was dismembered and the disk drive, power supply and RAM chips were set aside. Instead of a ready made PC we chose to buy one in its component form and build it ourselves. As well as being a cheaper option, we were able to utilise 512K of Apricot memory (but what an awful job it was getting the chips off the Apricot board). The power supply was more than adequate and the disk drive became a 720K PC drive. Various other small components were utilised and we saved over £120 on the price of the new machine. The office wirehead took the remains and turned the mono monitor into a repeater monitor for the reception PC. This saved another £70. He took the hybrid Apricot infra-red keyboard control and turned it into a controller for light and heat around the office.

Things to try and save are monitors, drives, power supplies, memory and anything else that isn't machine specific.

PRINTER BUFFER

Many small printers have a tiny printer buffer and you can lose productivity time waiting for a long document to print out. It isn't diffficult to utilise an otherwise life-expired computer to behave as a printer buffer. Even some of the small home machines with 32K of on-board memory are able to hold a large document in memory thus allowing you to continue working on the main machine.

TERMINAL

A communications terminal doesn't need a lot of memory, a pretty display or any high-powered processing. All that is necessary is the ability to access a serial port and modem and spool incoming files to some sort of mass storage. This requires a disk drive for efficiency, but if you aren't downloading files even that's not necessary.

HOST SYSTEM

The idea of running a host system or bulletin board (BBS) needn't be daunting. I've seen BBS running on the humble beeb, CPC and PCW and in much the same way as running a terminal, a BBS doesn't require much in the way of processing power, although some sort of high density disk storage is desirable for download and upload areas. Most machines can support some sort of host software and there are many host programs available in the public domain. This means that once you have machine and modem, the software costs aren't prohibitive.

HOW IT WORKS

This is the one for the wirehead. Once the computer's past its best, it can be put aside for electronic vivisection. There's no better way to learn about the way a machine works than to obtain manuals and other techie things and dissect the machine, learning the order in which things are placed and how they interconnect with each other.

Using a new machine is always a risk, but a machine surplus to requirements can be safely dismembered without fear of destroying the company accounts.

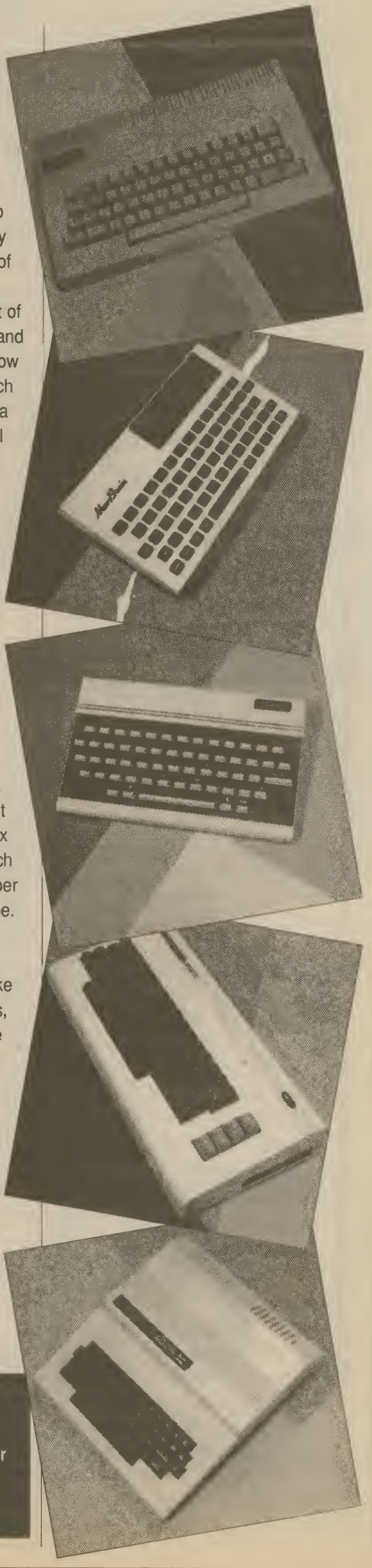
Most computers have some sort of input and output. Simple programs (and there are books full of these) will allow you to control external devices such as a robotic arm or a turtle (non ninja variety) or even the home central heating. These sorts of projects don't need a lot of processing power and only this week we received photographic evidence of an *Express* reader running the home environment with a Vic 20.

MONITOR

Not much thought goes into what to do with a dead monitor. If the tube's OK, you could build a TV modulator and turn it into a portable. Failing that, discard the tube and build in an aquarium or a glass fronted gerbil/hamster cage. Sit it on top of the original system box with a keyboard in front of it and watch your friends thrill to your new 3D super dynamic hamstervision or fish-o-scope.

GOING ... GOING ...

If all of the above are too much like hard work and you like loud bangs, set up your Amiga mega real time digitising kit in the car park of a tall building and persuade a friend to drop the offending computer from at least the ninth floor. The resultant free-fall followed by rapid deceleration can be captured in real time on your video screen grabber. You'll be able to examine the resultant grabs and plot the upgrading from 8-bit to several hundred bits all over the car park. ■



NEXT WEEK

Don't miss next week's Circuit City for all the tricks and tips on how to increase the power of your PC.

PLUG IN TO PROLOG

Radically different from other languages, Prolog skips all the usual procedures, functions and modules. Mary Branscombe gets you familiar with its unusual ways.

Prolog is a language designed for declarative programming and as such it is radically different from other, procedural, languages such as C and Pascal. There are virtually none of the constructs that form the basis of familiar languages: there are no procedures, functions or modules (although you can see clauses as procedures if you prefer, they do not really work in the same way). There are no loops, no if...then statements, no go tos and no main body to the program. Unless you are using Turbo Prolog, there are no type declarations to make at the beginning of the program.

With none of the familiar commands of other languages, what tools are there in Prolog? Because declarative programming involves declaring a problem and leaving the language to make what deduction it can, Prolog gives you methods for describing situations. Facts can be stated and definitions can be given; both are known as clauses. A constant or variable is known as a term. Constants are written beginning with a lower case letter, such as mole, while all variables are given an initial upper case letter, such as MolesInBath. To represent the relationships between objects, terms form part of structures, the first element of which is usually known as a functor or a predicate. The structure 'friends' is used to give two facts:

```
friends(mole, tiger).
friends(MolesInBath, tiger).
```

Both mole and any entity named in the variable MolesInBath are friends of tiger. All statements must finish with a full stop. There are two arguments in both facts, so 'friends' is known as a functor with an arity of two. Terms can be combined to form definitions. The term that is being defined is the conclusion and is known as the head of the clause and the definition is known as the body. The two are separated by the symbol :– like this: `conclusion:- definitions. For example, a definition of 'friends' could be:`

```
friends(Friend,Person):-
    likes(Friend, Person),
    likes(Person,Friend).
```

The variables in a clause can stand for simple objects, or for lists, which are represented as [Head|Body]. They can also represent complex terms or structures, as long as these can fit into the pattern. The terms mike, birdwatcher and birdwatcher(mike) will all fit into the pattern needed for the variables Friend and Person, but if you want to use the object mike from the structure birdwatcher(mike) later, you have to pull it out. If you know that there are different conditions for bird watchers, you can write another clause:

```
friends(birdwatcher(Friend),
Person):-
    birdwatcher(Person).
```

Another way of getting information out of a structure is to put it into a list, which can then be broken down by repeatedly pulling off the head. The conversion is done by a built in predicate, ..=, so that:

```
birdwatcher(mike)..=        [bird-
watcher, mike].
```

There cannot be more than one item in the head of the clause – you can only define one thing at a time. To prove whether a definition is true, Prolog looks for facts or definitions that match the statements in the body of the clause. If there is more than one definition, Prolog tries the first one it finds and goes on to the next if the first one fails. Although it may seem that this is similar to executing a procedure, what Prolog is actually trying to prove each of the lines in the definition; any calculations done are merely side effects. If one of the lines in the definition adds two numbers together, Prolog will add the numbers together to see if they produce a result that satisfies the clause it is trying to prove true, not to find out what the result is. In practice, you can ignore the distinction. In order to prove a term true, Prolog tries to find a statement of the term in its database. Terms and entries in the database must match exactly, or unify.

Unification works by substitution – when Prolog tries to match two terms, the functor and the objects have to be the same, or be similar so that one can be substituted for another. The contents of variables have to be the same, or be substituted. So friends(mole,tiger) will match with friends(Friend,Person); mole will unify with Friend, so that the value mole is now in the variable Friend. It cannot be removed, unless Prolog uses the clause again to prove a different theory, or unless it fails to prove a theory and says that a statement is not true.

The terms friends(mole,SomeOne) and friends(Friend,tiger) will unify, with mole being substituted for Friend and tiger being substituted for SomeOne, giving friends(mole,tiger).

When Prolog tries to prove that a term is true, it uses all the definitions if it needs to. If there is a more specific definition, that should be given first, so that it will be tried first. If one of the terms in the definition can be matched to the head of another clause, Prolog will then try to prove the terms in the second definition, and so on, until it finds a term that it knows is true, because it is listed in the database. So if the predicate 'likes' is defined as:

```
likes(Friend,Person):-
    nice(Friend).
```

then Prolog will look to see who it has listed as nice. If the list is:

```
nice(mole).
nice(tiger).
nice(mike).
nice(birdwatcher(_)).
nice(christopher_robin).
```

then Prolog will try each in turn to see if the value in Friend is the object referred to by 'nice', so that the two can unify. If the values are the same, then the clause will succeed; if not it will fail.

Two points to note; when the underscore is used on its own, as _, it is an anonymous variable that can hold a value but cannot be accessed. The underscore character can also be used as part of names. The convention is to use capitals in variables, for example MolesInBath and underscores in constants, for example christopher_robin.

To run a program, load the program into Prolog's database and then ask Prolog questions about it at the prompt, which is usually? With this code, the query could be:

```
? friends(Who, tiger).
```

The first answer that the language will find is:

```
Who = mole.
```

This is given as a fact in the database. If you hit return, the system will tell you that it has finished; the prompt is usually:

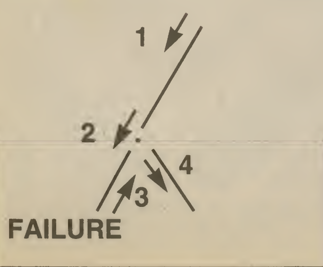
```
yes.
?
```

If you type a semi-colon (;), Prolog will go through the other definitions and try to find another answer. If it cannot, it will tell you that there is no answer:

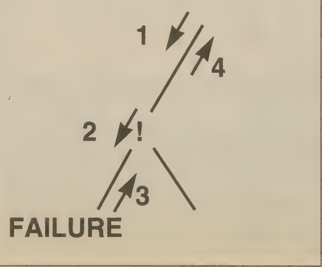
```
no.
?
```

If Prolog tries one definition and this leads to two possible definitions to test, it will try the first one first. If this fails, it will go back and try the second; this is called backtracking – see backtracking figure. If you want Prolog to fail after it has tried the first definition, you can put a cut, !, in your code. This can prune the amount of searching that your code does – see search path figure. ■

Backtracking



Search path with a cut



PROLOG

Most versions of Prolog are interpreted, but compiled versions are available – the best is BIM_Prolog. There is no ANSI standard for Prolog, but most versions of Prolog use the de facto Edinburgh syntax, which is used above; this is the most important feature to look for. All implementations will offer some built-in predicates for checking the type of objects, for example.

MicroProlog was designed as an educational language and uses a Lisp-like syntax based on parentheses, (friend mole tiger), for example. Turbo Prolog for the PC, originally from Borland, offers many built in predicates but is limited by the need to declare types in advance and only facts can be asserted to the database.

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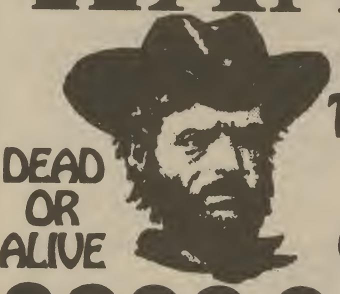
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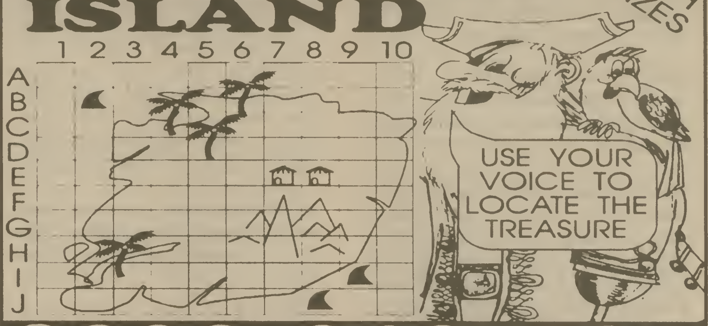
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D.i.e.	061-434 9907	V21/22/22b/23
Dambusters	0203 333195	V21
Dark Crystal	081-207 2989	Hst
Dark Halo	0392 434477	Hst
Dark Side	0446 33729	V21
Darkhaven	0604 413716	V21/22/22b/23
Data Network	081-478 5464	V21/22/22b/23
Datnet	0245 323693	HST/V32/V22bis/V22/V21
Datasel/wanderland	081-680 5330	V23
Datasoft Opus Bbs	0460 54615	V21/22/22b/23
Datatrade Qbbs	0536 725180	Hst
Dbase User Group	0532 842213	V21/22/22b
Dce Board	0296 88165	V21/22/22b
Dcs	081-879 7578	V21/22/22b
Deep Thought	0634 683696	Hst/v32
Desert	0244 550332	V21/22/22b/23
Desert BBS	0604 758126	V21/22/22bis
Diamond Opus	0791 86504	Hst/v32
Diggertel #1	0925 411265	V21/22/22b/23
Digital Matrix	021-705 5187	V21/22/22b/23
Direct Access	0935 79760	up to 2400
Direct-line 1	081-841 1847	V21/22/22b/23
Direct-line 2	081-842 2030	V21/22/22b
Domain Bbs	081-773 2422	V22/22b
Dragon'S Tower	081-202 0709	V21/22/22b
Dunedin Blackhole	031-669 2974	
Dwarfen Realm	0376 501036	V23v
Ebbs-1	0274 541156	V21/23/23v
Eddie'S Bbs	0635 71324	V21/22/22b/23
Edinburgh Castle	031 334 7043	HST
Empirical Research	0543675158	V21/22/22b/23
Empyrion	0792 580781	V21/22/22b/23
End To End	0376 84644	V21/22/22b/23
End Zone	0524 752245	V21/22/22b/23
Engineers Workbnch	051-327 7036	V21/22/22b
Equaliser	0232 454097	V21/V22b/V23
Eureka Gateways	0603 250689	V23/23v
Eureka Ii	081-683 0629	V21/22/22b/23
Exchange S/w	0767 5051	V21/22/22b/23
Eye-2	0525 715789	V21/22/22b/23
Fal Opus	0736 794827	V21/23
Falcon Bbs	081-527 4165	V21/22/22b/23
Family Skeletons	0480 812097	V22b
Fen Tiger	0954 210692	V23v
Fido Uk1	0734 713909	V22/22b
Firm	0273 513872	V23v
Flight Path	081-759 1957	V22/22b
Focus International	0905 795002	
Focus Tbbs	0303 42690	Hst
Focus Uk	0905 774477	V21/22/22b/23
Forum-80 Hull	0482 859169	V21
Fox'S Den	0689 27085	V21/22/22b/23
Free Net One	0767 51972	V21/22/22b/23
Freelance Lynx	0480 406261	V21/22/22b/23
Friday The 13th	0642 224833	V21/22/22b/23
Fuzzy Logic	0634 200707	V21/22/22b
Gabbs	0705 524805	V21/22/22b/23
Gallery Qbbs	081-847 2795	V21/22/22b
Game Over	0752 848070	V21/22/22b/23
Games Online	0273 699200	
Gaslamp	0706 358331	V21/22/22b/23
Gaugonzola Bbs	0453 511112	V21/22/22b
Gnome At Home	081-888 8894	V23v
Gods	081-994 9119	V21/23
Golly!	0734 320812	V21/22/22b/23
Goobtel	0602 706307	V21/23
Good Life	081-541 0187	Hst
Gopherit'S Box	061-320-3208	V21/22/23
Gourmet	0474 536654	V21/22/22b
Grainstore	0905 770198	V21/22/22b
Grenadier	0825 762803	V21/22/22b
Hacker'S Delight	0702 523853	V21/22/23
Halfwits Bbs	0272 340310	V22/22b
Hamnet	0482 465150	V21
Harlequin	061-945 3612	V21/22/22b/23
Hastings Bbs	0424 717919	V21/22/22b/23
Hawk'S Castle	0344 411621	Hst
Hazzard Bb	071-737 0505	V21/22/22b/23
Health-data	081-986 4360	V23v
Heartbeat	0734 352032	
Hilary's Board	0277 233468	V21/23
Hot-air Opus	0579 70347	V21/22/22b
Humber Bridge	0482 850785	V21/22/23
Ichthus (trinity 3)	0734 461466	V21/22/22b/23
	0903 700771	V21/22/22b/23
Index Linked	0227 770403	V21/22/22b
Infocomm UK	0895 72021	V21/V22/V22
BIS.Intel Ace	0832 73003	V23v
Islington Bbs	071-704 0760	Hst
	071-226 1248	V21/22/22b/23
Jabulon Bb	0254 59352	V21/23/23v
Jersey Bbs	0534 37779	V21/22/22b/23
Jersey Opus	0534 39389	V21/22/22b/23
Jocks Away!	031-225 5368	V21/22/22b/23
Jolly Fisherman	0754 67796	V21/22/22b/23
Jolly Roger	081-742 1640	V21/22/22b/23
Jusavo	0324 32414	V21/23
Just The Place	0705 258694	Hst
K-wood	0608 83458	Hst
Kashmir'S Bbs	0472 347882	V21/22/22b/23
Kernow Bb	0209 821670	V21/22/22b/23
Key-board	0908 668398	Hst
Keydata	081-676 0072	V23v
Kidlington Bbs	0865 56703	V21/22/22b
King Of The Castle	0233 620228	V21/22/23
Kirklees Opus	0484 665415	V21/22/22b/23
Kleopatra's Pyramid	0602 384281	V21/23/23v
Komputer Knldge	0844 274066	V21/22/22b/23
Kybernesis	081-673 7294	V21/22/22b/23
Labyrinth	051-724 4458	V21/23
Lamplight Qbbs	0705 811531	V21/22/22b/23
Laser Tbbs	0532 438430	V21/22/22b
Lau'S Ql Bb	081-751 6096	V23v
Lightfinger's Place	0202 485723	V21/22/22b/23
Linelight	0580 212043	V23v
Linx Bbs	0522 511277	V21/22/22b/23
Liquorice Allsorts	0633 279985	
Liverpool Mailbox	051-428 8924	V21/22/22b/23
Liverpool Ros	051-931 4271	V21/22/23
Loch lomond	0389 55762	V22/v22bis
Loft	0442 230461	V21/22/22b/23
Logical BBS	0772 623167	300-2400
Log On In Tynedale	0434 606639	V21/22/22b/23
London Bb	081-455 6607	V21/22/22b/23
London City Mag	081-468 7648	V21/23/23v
London Connexion	081-667 1313	V21/22/22b/23
London Embassy	081-366 1778	Hst
London Guest Hse	081-748 0974	Hst/v32
London Mail Centre	081-534 1200	V21/22/22b/23
London Metropolis	081-519 1055	V21/22/22b/23
Loony Bin	0703 787489	V21/23
Mabbs	021-444 8972	V21/22/22b/23
Mach II Bbs	0242 260 685	V21/22/22bis
Mactel Hq (grn Box)	0602 455444	V21/22/22b/23
Mactel Metro	081-543 8017	V21/22/22b/23
Mactel Phoenix	0473 610139	V21/22/22b/23
Madness Bbs	0603 300947	V21/22/22b/23
Magic Castle Bbs	021-430 3761	V21/22/22b/23
Magic Mushroom	0361 83641	V21/22/22b
Magnum	0274 547006	V21/22/22b/23
Magrathea	0376 24402	V23v
Manor	0980 863031	V21/22/22b/23
Marctel	081-346 7150	V21/23/23v
Matrix	051-255 0225	V21/22/22b/23
Mbbs Leconfield	0964 550745	V21/22/22b/23
Mbbs Mitcham Iic	081-648 0018	V21/23
Medway	0634 280031	V21/22/22b
Mektronic Cnsltnts	061-773 7739	V21/22/22b/23
Mercianet	0203 611943	V23v
Merkinstead	061-434 7059	V21/22/22b/23
Merlin	0443 834179	V21/22/22b/23
Mgbbs	0443 733343	V21/23S
Micro Live Bb	081-567 6500	V21
Micro Update	081-877 1529	V21/22/22b/23
Microdeal	0726 65422	V21/22/22b/23
Microlog	0422 71921	V21/22/22b/23
Microview!	081-509 0729	V23v
Midget Gem	0748 834836	V21/23
Midnight Caller	0633 279243	V21/22/22b/23
Mind Boggles	0362 762868	V21/22/22b/23
Mininet 3	0642 672813	V21/22/22b/23
Miracom Support	0473 232540	Hst
Mirage	061-652 1242	V21/22/22b/23
Mirror Ii	0628 810889	V21/22/22b/23
Mirrorworld/quest 1	0883 844044	V23
Mission Impossible	0602 654329	Hst
Mk Board	0908 671289	V21/22/22b/23
Mkbbs	0908 504556	V22/22b
Monkey Tree	0952 677002	V21/22/23
Monusci	0293 545665	V21/22/22b/23
Motor Exchange	0484 435314	V21/22/22b
Multi-bbs	041-649 9043	V21/22/22b/23
Murdoch'S Hangout	021-711 2620	V22/22b
Murky Caverns	081-426 9386	Hst
Mwcfe	0926 421844	V22bis
My Little Phoney	0865 773277	V32/HST
Nicc Mid-west	0341 250377	V21/22/23
Nite Life	071-976 6807	V21/22/22b
No Escort Required	081-200 3817	Hst
No.1 Bbs	081-958 1689	V21/22/22b
Noah BBS	0272 572322	300-2400
Norpac	0434 608324	V21/22/22b
North Wales Bb	0978 88372	V21/22/22b
North Yorks Qbbs	0423 868065	V22/22b?
Northern Lights	0768 773685	V22/22b
Norwich Onion Bbs	0603 423305	V21/22/22b/23
Nova	0455 553371	V21/22/22b
Nova-net	0274 370760	V22
Odd-ball	081-679 2583	V21/22/22b/23
Open Access	081-427 3974	
Optix	0482 872294	V21/22/22b/23
Organic Garden	081-464 3305	V21/22/22b/23
Out Of The Blue	081-668 7667	V21/22/23
Owl Service	0532 605876	V21/23
P'S & Q'S Tel	051-236 3105	V21/22/22b/23
Pacific Lightning	0732 845338	V22/22b
Packet Bbs	081-547 1479	V21/22/2
Packet Place	0484 435620	V21/22/22b
Palm Beach	0303 265979	V21/22/22b/23
Pazaz Viewdata	0383 620259	V23v
PC Access	071-608 0081	V21/22/22b/23
PC-Amiga Link	04023 84914	up to 2400
PC Forum	0322 335348	V21/22/22b/23
PC Serve Shop	081-864 2633	V21/22/22b/23
PC Serve Softnet	0895 420164	V21/22/22b/23
PC Serve Storehouse	0494 728094	V21/22/22b/23
Pc-vax Opus	081-800-3549	V21/22/22b/23
Pcamiga Bbs	0602 735119	V22/22b
Peacenet West	0895 448998	V23v
Pecan Software	0272 248076	V21/22/22b
Penguin	0943 830820	V21/22/22b/23
Phantom	0226 340425	V21v/22v/23
Phoenix	0249 817704	Hst
Piston Popper	0424 853361	
Plug-ole	021-472 0256	V21/22/22b/23
Plus And Minus	0559 322766	V21/22/22b/23
Poacher	0476 62450	V21/22/22b/23
Polynet Bb	071-580 1690	V21/22/22b/23
Port Of Call	081-391 5779	V21/22/22b/23
Power Play Qbbs	0698 423669	V21/22/22b/23
Power Tower	0533 880114	V21/22/22b/23
Prestonet	0772 612462	V23v
Project Bbs	0384 401770	V21/22/22b/23
Prometheus	081-300 7177	V23v
Proximity	0793 480028	V21/22/22b/23
Publishing Shop	091-261 5228	V21/22/22b/23
Purely Pc	0232 645942	V21/22/22b
Pyramid	071-239 0871	V21/22/22b
Pyroto Mountain	0895 59071	V21/22/22b
Quasar	0846 693067	V21/22/22b
Really Interesting	0582 414991	
Reflex Bbs	0703 685527	V21/22/22b/23
Regency Bbs	0542 33050	V21/22/23
Remote!pcw	0555 851887	V21/22/22b/23
Rivendell	0602 640488	V21/22/22b/23
Rm Tech. Support	0865 796431	V21/22/22b/23
Road Runner	061-483 4105	V21/22/22b/23
Royalink Uk	0962 66807	V21/22/22b
SAC Bbs	0242 260685	V21/22/23/22b
Sas Bbs	0742 325232	V21/22/22b/23
Satellite Southwest	0392 53116	V21/22/22b/23
Scabs	0909 479080	V22bis
Scary Monster	0734 320297	Hst
Scot Air	0505 36036	V21/22/22b/23
Scothelp-St	031-343 6368	V21/22/22b/23
Scottish Opus	041-880 7863	V21/22/22b/23
Scottish Wildcat	0674 671141	V21/22/22b/23
Scs One	0444 236002	V22b
Sector	0772 454328	V23v
Semaj Qbbs	0303 862415	V22/22b
Sentinel Bb	0628 781429	V21/22/22b/23
SES Databoard	0622 630240	V21/V22/V22bis
Shades	0342 810905	V23
Shadowfax	0252 528146	V21/22/23
Shadowland	081-897 0488	V21/23
Shasby'S Lair	0772 561066	Hst
Sherwood Forest	0602 397113	V21/22/22b/23
Short Circuit	0273 462967	Hst
Sid (acorn Service)	0223 243642	V23v
Signal Box	081-337 6583	V21/22/22b/23
Sin Bin	0532 661536	V23
Sirius	081-542 3772	V21/22/22b/23
Sirius Ii	0494 778425	V21/22/22b
Skull's Tower	081-943 1194	V21/22/22b/23
Sky-line	0603 742273	V21/23/23v
Skyline 1	0234 741691	Hst
Softmatic Bbs	0733 322540	V21/22/22
Software Source	0892 661149	V22/22b
Sorcerer's Dungeon	0636 815705	
Sounds Of Mercia	0203 682896	V21/22/22b
South Lincs BBS	0780 63954	
Sparx	0793 480287	V21/22/22b/23
Split Infinity	0342 712248	V23v
Pook Bbs	0268 767365	V21/22/22b/23
Sphere BBS	0294 221350	V21/22/23/22b
Spuds Xanadu	0203 695266	V21/V22, V23, V23b.
Sputnik Spitfire	0501 31754	V21/22/22b
St London Bbs	081-443 2432	V21/23
Stabb	0793 855176	V21/22/23/22b
Staines Bb	0784 465794	V21/22/22b/23
Starbase One	071-733 3992	V21/22/22b/23
Steve and Jackie's	0703 650037	V21/V22/V22b/V23
Strange Brew!	081-665 5038	V22/22b
Stun User Network	061-429 9803	V21/22/22b/23
Summer Wine	0484 653234	Hst
Sunburn Inc.	021-449 5269	V21/23
Super Ops Bbs	0782 284081	V21/22/22b
Swindon Newc Bb	0793 616683	V21/23
System-c-v	0403 50607	Hst
T.a.b.b.s.	0533 517615	V21/22/23
Tabbs	0225 743797	V21/22/22b/23
Taecomm	0994 6709	V21/23
Taff'S Retreat	0834 4562	V21/22/22b/23
Tardis	0772 27236	V21
Tasque	0355 222664	Hst
Tasug Opus	0904 760129	V21/22/22b/23
Tavern	081-445 6514	V21/22/22b/23
Tbbs-rovoreed	081-542 9767	V21/22/22b/23
Tequila Sunset	0703 867786	V23v
Terminal Net 5	0402 456135	V21/22/22b/23
Terminal-net	081-423 5262	V21/22/22b/23
Tharr Bbs	0234 261804	V22/22b
Third Wave	071-585 3163	V21/23
Three Kings	0354 56267	V21/22/22b
Track 83	0953 851351	V21/22/22b/23
Transylvania	0274 621668	
Tranz-com Bbs	081-952 6273	V21/23
Trinity I	0392 410210	V21/22/22b/23
Trinity Ii	0367 22764	V21/22/22b/23
Tug Ii	0905 775191	V21/22/22b/23
Twilight Zone	081-788 0884	V21/22/22b/23
Twilight Zone Ii	071-608 1485	Hst
Uk Healthlink	0942 722984	V21/22/22b/23
Unisys Etoi Bbs	081-453 5739	V21/22/22b/23
Unit One	0285 713688	V21/22/22b
VITAS	021-749 5860	V21/23
Valente'S Bbs	071-978 2078	Hst
Vector System	0329 45824	Hst
Viking East Anglia	0255 503048	V23v
Village	081-464 2516	V21/22/22b/23
Village Fayre	081-841 5971	V23
Voyager Bbs	061-725 9580	V21/22/22b/23
West Norfolk	0553 761290	1200/2400
White Lightning	0635 37259	V22/22b
Whitehall Pent	071-930 3903	V21/22/22b/23
Wild Imaginings	091-263 4303	V21/22/22b/23
Winchester Remote	0962 69322	V21/22/22b/23
Wolver'ton Ros	0902 745337	V21/22/22b/23
Womble Base	081-979 9606	V23
Woodgreen Bbs	081-889 5624	V21/23
Yugo Bbs	0734 753648	V21/22/22b/23
Zeus Bbs	0487 710487	V21/22

Get yourself listed!

If you run a user group or bulletin board, don't miss out – fill in this form for a free entry and send it to Express On-line, 30 Monmouth Street, Bath BA1 2BW.

Name of group/BBS (Delete as applicable) ....
Address:..
....

- Write your ad on the in block capitals on the grid below using one letter per block.
- Also, please let us know if any of the information is out of date

EXPRESS EXTRA

Welcome to the bargain basement, where we hand out valuable help and advice on where to go and how to get the best deals when it comes to buying cut-price computers. Plus our regular comprehensive guide to auctions around the UK in the coming weeks.

While Shopping Express is undoubtedly the the perfect way to track down the best bargains in the computer world, many people are still, perhaps understandably, wary of buying products through mail order or through personal ads. This is mainly because you usually cannot see the item you are buying before you hand over your money.

We do everything in our power to make sure that all the advertisements we run are above board. But here are a few tips designed to take the risk out of buying through the post or over the phone.

- Be precise in describing what you want to buy. Leave no room for error. Feel free to go overboard in double checking details - make, model, specifications, colour, size, the page number and name of the magazine in which you saw the advertisement etc.
- Confirm the price you are supposed to be paying. If you are phoning a company check whether there are any hidden extras, such as postage and packaging.
- Check how the item will be delivered to you and how long it should take. This is especially important with reader ads where delivery details are rarely mentioned.
- If you are writing off for the product keep copies of all letters. If you are phoning, note down details of when you phoned and who you spoke to.
- If possible enquire about guarantees and servicing. Check the supplier's policy on returns and refunds. With reader ads, it is probably best to make the effort to see the item personally before you hand over any money.
- It is best to to pay by credit card, especially for items over £100, as this provides extra cover under the credit card companies' own insurance schemes. Otherwise use a crossed cheque or postal order. Avoid sending cash at all costs. ■

MARCH AUCTIONS ROUND-UP

SOUTH EAST

ABTEK (0722 413337)
23 MARCH – New College, Helston Road, Swindon.
Viewing and testing from 8.30 am. Auction starts 11am.

MCD (0932 788600*)
16 MARCH – St Paul's School, the Ridings, Green Street, Sunbury-On-Thames
6 APRIL – St Paul's School, the Ridings, Green Street, Sunbury-On-Thames
Auctions start at 10.30am. There is viewing and testing on the evening beforehand from 5pm-8 pm, and on the day from 9am.
* Please note the new of phone number.

HEMPDEAN TECHNOLOGY (0734 461384)
2 MARCH – Crosfields School, Shinfield Road, Reading.
Sale starts 10.30am. Viewing and testing from 9am.

TECHNOLOGY COMPUTER SERVICES (081 651 3639)
9 MARCH – Kemnal Manor School, Sevenoaks Way, Orpington, Kent.
Auction starts 10.30am. Viewing and testing from 9am.
23 MARCH – Pickhurst Junior School, Hurst, Bromley, Kent.
Auction starts 10.30am. Viewing and testing from 9am.

TRADERDESK (0527 579120)
23 MARCH – Harrow Leisure Centre, Harrow, Middlesex.
Auction starts 11am. Viewing and testing from 9.30am.

MIDLANDS

TRADERDESK (0527 579120)
2 MARCH – National Motorcycle Museum, National Exhibition Centre, Birmingham.
Auction starts 11am. Viewing and testing from 9.30am.

MANCHESTER

COMPUTER CONNECTIONS (0254 813316)
2 MARCH – Bowlers Leisure Complex, Trafford Park, Manchester.
Sale starts 11am. Viewing and testing from 8.30am.

BIDDING TIPS

- Prices at auctions can be quite a lot lower than in shops, but you will have to pay in full on the day.
- Make sure to get a catalogue before you go along. If you phone the companies they should be happy to supply you with one.
- Set yourself a limit.
- Give your selected items a good looking over and check if there is any warranty. If there is not you still have the rights of a second-hand buyer. Under the Sale of Goods Act you are entitled to a refund if the item is faulty or does not match up to the description given.
- Wait for the auctioneer to call the first bid. He'll come right down if no-one offers.
- Don't be tempted to outbid over the odds. You might come up against a dealer for whom a bargain is just a higher than normal margin.

If you run auctions anywhere or know of any coming up in your area please contact us with the details so that we can make this listing as comprehensive as possible.

Write to New Computer Express, 30 Monmouth Street, Bath BA2 2BW. Telephone 0225 442244 or fax 446019.

SECOND-HAND PRICE GUIDE

As usual, just a few points to bear in mind:

- The following chart is compiled from the reader advertisements we have received for Shopping Express over the last month, and the items listed are those which have been advertised in sufficient quantities to calculate the averages.
- The lower priced products are usually need repair work of some sort.
- The higher priced items are invariably offered as part of a package with numerous add-ons and mountains of software. This is why the higher figures quoted under 'range' can often be higher than the machine will cost brand new.
- Remember, this is only a rough guide, so if you find a PC down your local market for £20, bully for you.

	Range	Average	Trend
Spectrum	£50-175	£100	▲
Spectrum 128	£100-195	£160	▲
Spectrum Plus 2	£110-225	£177	▲
*Spectrum Plus 3	£100-200	£164	▼
QL	£60-80	£75	▼
*C64	£100-320	£200	▲
C128	£100-250	£140	▼▼
*CPC464	£150-350	£230	▼
CPC6128	£165-450	£310	▲▲
PCW 8256	£200-400	£270	▲▲
PCW 9512	£325-525	£370	▼
PPC640D	£295-420	£350	NEW
PPC512D	£350-450	£270	NEW
Acorn Archemedes	£500-800	£700	NEW
*520STFM	£140-400	£280	▼▼
1040STE	£190-380	£300	◆
520ST	£260-285	£270	◆
800XL	£80-150	£105	NEW
STE	£160-375	£300	▼
Lynx	£59-200	£130	▼
Portfolio	£150-200	£175	▼▼
*A500	£200-650	£410	▼
PC Engine	£75-250	£170	▲
PC Engine with CD ROM	£320-600	£480	NEW
Sega Master	£70-200	£115	▼
Sega Megadrive	£110-400	£220	▲
Gameboy	£100-110	£105	▼
Game gear	£150-190	£170	NEW
Neo Geo	£200-500	£350	NEW
Sam Coupé	£160-185	£165	◆
LC10 Printer	£100-180	£140	◆

* – advertised most frequently
▲ – more expensive than last month
▲▲ – over £50 more than last month
▼ – less expensive than last month
▼▼ – over £50 less than last month
◆ – no movement
New – now selling in significant amounts

As predicted last month the prices have generally come come down, probably because people received new consoles and machines for christmas and are getting rid of their old ones. You can even buy STs now for a fairly reasonable second hand price, though they are still unnecessarily bundled with a loads of games, many of which are so ancient they are next to obsolete.

The hand-held consoles are coming into their own too with the Game Gear now selling enough volume to appear in the chart, and a surprise new entry from the PC Engine with CD ROM. Maybe it's a new status symbol – being able to sell off something second hand that 99.9 per cent of the population hasn't even seen first hand yet.

TECH TIPS

Does your MIDI lack memory? Need some help to make the most of your software? Full of terrific tips for other readers? Send your stories and queries to Keith Pomfret, Tech Tips , New Computer Express, 30 Monmouth Street, Bath BA1 2BW.

■ HELP! Ghandi Pandy

We live in a multi-racial society and our children regularly mix with children of other cultures. I believe in trying to integrate with all people regardless of race, persuasion or creed and encourage my children (Emma, 8 and Tobin, 11) to do the same. Some of the children's Asian friends have started to teach them Gujarati and Punjabi to help them understand the Asian culture.

As computers play an important part in education, it occurred to me that perhaps we should buy a word processing program for the home computer that can word process in the ethnic tongues. I have spoken to our local Asian shopkeeper and although he has a stock control program from India that supports his own language, he was unable to point us toward any word processor. His program only runs on a PC and even if it were of use to us, we couldn't use it as we have a BBC A3000 and a BBC Compact.

Can you give us the name of any company producing or importing Asian word processing software?

Jill Higgs, King's Norton

Cambridge educational specialists ESM should be able to help you with your needs. It does a word processing package for the BBC B and Compact. Its Asian Folio package is available in Hindi, Gujarati, Bengali and Panjabi. These programs are £45 each and should go some way toward racial harmony and integration in your childrens' computing. Although they are aimed at schools, they seem to be the closest to your requirements.

A nice touch with Asian Folio is a transparent keyboard cover and an adhesive sheet of Asian characters to overlay the traditional QWERTY layout.

If you want more than one of the languages, it is possible to get second and subsequent softare for £27.50 without manuals. Contact ESM on 0223 65445.

■ HELP! MIDI memory

Why is it that when I want to utilise velocity sensitivity and aftertouch using my MIDI keyboard and Amstrad CPC 6128, I am strictly limited to the amount of music that I can record?. I use the MIDI track Performer and interface and can normally get a good length piece of music, but as soon as I switch on performance controls, my time evaporates. The local music shop says that I'll need a better computer with more memory but as I'm a semi-pro who has to watch every penny, the thought of spending on an ST, Amiga or PC, then having to start buying software and interfaces is daunting.

Robert A Boll, Darlington

In the long run, if you want to get the best out of MIDI you'll probably need to upgrade but the CPC6128 and EMR MIDI track is a reasonable combination for semi-pro work.

The problems you are experiencing are caused by performance controls like velocity, sensitivity, after touch, etc, constantly changing.

With a simple note on or note off command, a single packet of data can handle each event. Between note on and note off there is no change of condition so no data is sent. With velocity and after touch, the values are varying all of the time so a constant stream of data must be sent. When you save a song file, all of this continuous data must be stored along with the simpler event data and thus the files become larger 'per bar'. A song that fitted comfortably into the memory without extra performance data could be short of space when this is added.

Short of turning off this constant stream data, the only way that you will get velocity (amplitude) changes, is to go to a different system.

■ GIFT! Spectrum manual

I write in response to D Morris' letter requesting a manual for a Spectrum 128K (the original) and I enclose the manual required would you please pass it on.

Charles Vickers, Middlesborough

Thanks for the manual which I'm sure will make D Morris's day. If Mr Morris will give me a call and remind me of his address, I'll post it straight to him.

■ HELP! of Aquarius

'I'll say anything to get help', I have just made a fantastic purchase – an Aquarius for a fiver, complete with power pack and cassette player. This should go well with my Dragon and Speccy. The only snag is there is no manual or software with it. I can get text on screen OK but I cannot fathom out how to get GRAPHICS or change screen mode. If anyone can help with a manual or some instructions I would be forever in their debt.

Who knows someone may even be able to supply a little software. "Well one can always hope"

Also have any games been written for the Q.L?. (yes I have one of those as well).

I'm afraid I'm beyond help. It must be old age.

John Bentham, Leicestershire

And to think I've spent all of my adult life thinking that Aquarius was a star sign. Seriously though, I have checked through the Tech Tip Archives and can't find any manuals or information on this long defunct machine. Now's the chance to find out if any *Express* reader will admit to owning or understanding one.

Any help should be directed to Mr Bentham via Tech Tips.

While Mr Bentham still has some credit left, I'll pause to say that yes, there were wads and wads of QL games. Although they may appear a little thin on the ground at the moment, a phone call to QL experts EEC should point you in the right direction.

EEC is on 0753 888866.

■ HELP! Amiga Cadet

42 years old, recently redundant and the wife took most of the redundancy cash for central heating, triple glazing (not double, bloody triple) and a conservatory.

In order to shut me up she allowed me a small share of MY redundancy money to replace my ageing C64 with a more serious computer.

I certainly foxed her that time and am the proud owner of a pristine Amiga 3000 and various peripherals. With such a powerful machine to hand, it seems a shame to waste the potential by playing games so I've bought a word processor, database etc and a couple of Amiga specific books.

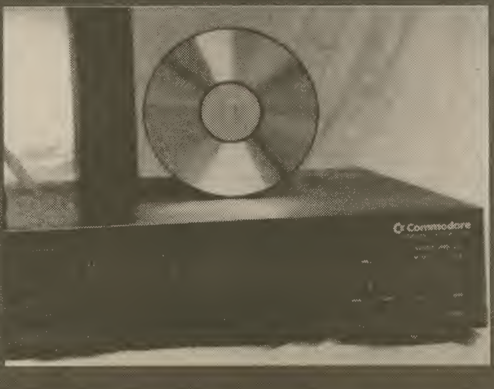
I'm no chimp and until redundancy, I was a project engineer in the nuclear industry but every book so far seems to be written assuming that I already understand the Amiga disk operating system. To complicate matters even further, none of the books that I've seen so far cover AmigaDOS V2 that comes as standard with the Amiga 3000. Please help me to find

■ Help! ROM-drive

With the recent publicity of CD-ROM and Commodore's CDTV, could you please explain the difference between the two. Will it be possible to load software on CD-ROM into a computer using the CDTV system?

Andrew Reid, Liverpool

A CD-ROM is simply a mass storage device for interfacing with a computer. CDTV is a total environment for interactive learning and entertainment. The CD device inside the CDTV could be described as a CD-ROM drive but a CD-ROM drive couldn't be called a CDTV. As of yet, we haven't had hands on experience or the full technical specification of CDTV but it would be a surprise to us if it was compatible with existing CD-ROM systems.



some books to spend my last few quid on before the missus appropriates the cash for a new shower rail.
Simon Trout, Slough

Help is at hand or at least as close as your nearest bookshop. *Mastering Amiga DOS 2* volumes 1 and 2 are a complete guide to the operating system of the Amiga 3000 and also include information on versions 1.2 and 1.3.

Volume One costs £21.95 (ISBN 1-873308-01-9) and includes a disk with useful utilities and Volume Two costs £17.95 (ISBN 1-873308-00-0). Both books are written by Amiga DOS expert Mark Smiddy and neither assume a prior knowledge of the system. The format is to present the various commands and uses of the Amiga operating system and discus their parameters and use.

■ HELP! C64 Amiga stuff

I have recently bought an Amiga 500 but cannot afford to buy a printer for it.

I still have a Commodore 64 with an MPS801 printer and an Excelerator Plus 5.25-inch disk drive.

Is it possible to use the printer or the disk drive on the Amiga with a special lead or interface or something? If it is only the disk drive that can be used, it would be best to have it switchable so that files could be created on the Amiga and printed from the '64.

If none of this is possible using leads, would it work by using a '64 Emulator on the Amiga. If so please recommend one.
Ian Dibley, Aylesbury

The Printer will work from the serial port of your Amiga using the appropriate lead and printer driver. The option to use a serial printer is in Preferences, where you will also find a driver for the Commodore MPS series of printers. Forget using the drive as it is a difficult job that will cost you much more grief than the £40 or so that a second Amiga drive can be bought for. If you need a lead making up contact Simpson Electronics on 0332 760353 or RSD Connections on 0992 584205.

■ HELP! Stop Press

I use an Amstrad 4128 (a converted 464) and as well as the fine word processing program Tasword, I have started to produce DTP output for the company magazine using *Micro Design* and *Stop Press*. The company is planning to go upmarket with the magazine and has put me in touch with a professional printer to replace our normal method of photocopying.

I spent half an hour being baffled by the technical terminology (fonts, leading, etc) and was completely baffled with what he said that he needs. How do I get *Stop Press* and *Micro Design* to do a post script. I've looked through all of the manuals and can't find a mention.

The printer was such an obnoxious know all that I don't want to go back to him and ask. His attitude was one that I shouldn't even consider continuing and that I should leave it to him, the expert. With a final curl of the lip he explained that I could present camera-ready work if all else failed. HELP!
Pete Morgan, Stalybridge

Neither *Stop press* nor *Micro design* are capable of, or can be converted to, PostScript output. PostScript is a page description language that is widely used by DTP packages on 16-bit machines.

If you're happy with the output of *Stop Press* and *Micro Design*, you should follow the advice of your curly-lipped printer and present him with camera-ready work. This means laying out the pages in the normal way and presenting them to your printer instead of putting them into the photocopier.

If you want to be a bit more adventurous though, and there are PCs around and a bit of cash for software, you could invest in budget DTP software such as *Timeworks, Finnesse* or suchlike.

These PC programs are cheap and can provide a cost effective way to learn about DTP while providing a more professional output.

If your company is really going up market, an investment of around £2,000 will buy you an Apple Macintosh system and a laser printer that will enable you to produce documents, letters, magazines and even books to the standard and quality you see in *Express*.

■ HELP! Arty programs

I use three Art Programs: *Paintshow* plus from Logitech, *Dr Genius* from Scanman and *Fleet Street Editor* from DTP. The first program uses TIF extension, but has a utility enabling the TIF to be converted to MAC or PCX, which is great as the Fleet Street Editor used .MAC files. But program 2, Dr Genius uses CUT extensions. I am therefore unable to transfer graphic files to *Paintshow* or *Fleet Street Editor*.

I have tried a PD software utility called Uconvert. But this will not convert .CUT files to .MAC or .PCX.

I have tried everything, everybody, and everywhere for a solution., but to no avail.

HELP – HELP – HELP. PLEASE - PLEASE – PLEASE!

I have had your great magazine from issue one. It gets better all the time.
Neil Hirst, Hereford

Unfortunately, I'm not sure what the answer to your problem is, but with the thousands of budding DTP people out there, I'm sure that someone can help you. So it's over to the readers.

■ HARD! As nails

A friend of mine, Richard, wants me to start writing demos for Amiga PD libraries. He gets the easy job of doing the graphics and music! I can do a few simple things in BASIC and Amiga DOS, but I would like to use an assembler or what ever other demo writers use. Is it really hard to do or just hard? Do you know of any books that I could learn from and the best software packages for demo writing.

I know I can't be quite the quality of Red Sector or Share And Enjoy in a month but is it possible I ever will (remember we're talking about Timo here!)

Also, is it OK to 'rip' music from another demo groups demo and stick it on my, err, our demo as long as I credit it?

Now could I give your readers a tip? Tune to Radio Nova on 11.273GHz/H (Lifestyle) 7.56MH/z (Audio 6) on the Astra 1A satellite at 19.2deg East. It's a great radio station! Did you know about satellite radio? Well you do now.
Timo, Bucks

Assembler is harder than the entire cast of *Auf Weidersehn Pet* and if you are only doing bitties in BASIC and DOS, will probably come with a culture shock similar to being run over by a 24 tonne coach. The best way to learn about Assembler (or C or Pascal or any other language) is to find someone that's already proficient and get them to help you. Once you've got a basic understanding of the subject, you will be able to choose your own reference books from the many available in libraries or bookshops.

You mustn't ever rip off anything from anyone elses programs or demos without their written and dated permission. Imagine how you'd feel if you'd written something and you found someone else selling it without your permission! Not too pleased, I'm sure.

■ TIP! Arch modulator

In answer to the letter from that distressed chap in *Express* 116, concerning a TV modulator for the A3000, I have the answer to his problem. A modulator is available from HCCS Associates Ltd, for £39 (£44.85 inc VAT) HCCS can be contacted on 091 487 0760, or at Engine Lane, Gateshead, NE9 5JJ.
Kenneth Macleod,Scotland

I'm sure he'll be chuffed with your kind help. Thanks very much.

■ Help! We're getting there

I have decided to write an *Autoroute* type program for rail travel on the PC. I'm used to programming interactive data recovery systems so the bones of the program shouldn't be too hard. The problem that I have is getting the data. Where is it? Can I easily get hold of it.? Is it copyright and do I have to get a licence to use it? I don't want to write the program as an academic exercise, I need the money.
Raymond Eve, Swindon, Wilts

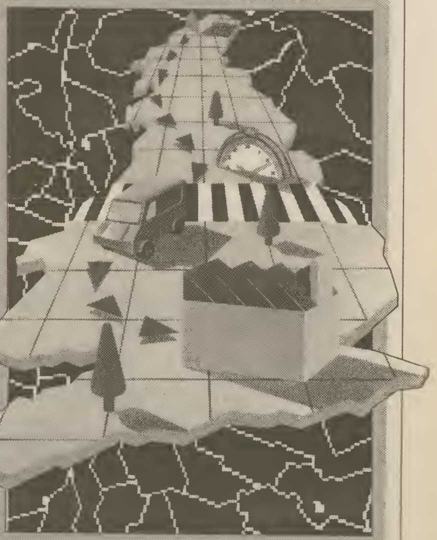
You've set yourself a monumental task there. First, you'll have to get permission to use the data from British Rail as it's in BR's timetables and one can only assume that it carries BR's copyright. The data that you need is contained in the British Rail Passenger Timetable available at £4.50 from a station near you. As BR is in the habit of making major changes to its timetable twice a year and making smaller changes on an almost weekly basis, you may find it difficult to keep up with the alterations.

I spoke to one of our resident programmers who reckoned that what you are talking about is essentially two programs. One would optimise your route and work out the most efficient way of getting you there. The second would take the timetable data and see if it was possible given the time constraints.

Also, what about the complex fare structure that means that even the simplest alteration or deviation from the plan can double the cost?

To expect a standard PC to do this sort of route planning is to expect a bit too much of it. The only way that I can see of making it possible is to do each task separately and then combine the data for a composite result. This may be extremely time consuming.

The longest (and worst) job of all though, will be the typing in of the 1712 pages of the timetable. Unless you can persuade British Rail to let you have all the data in disk form, you've got an awful lot of typing to do. Even technology can't help you there. I tried several suites of OCR (optical character recognition) software, but didn't have much success on copying the timetable.



• Autoroute: a British Rail equivalent on the way?

BIG BUCKS ON SCREEN

MAKING THE MOST

Invest in a multisync monitor and the rest your days will be trouble free . Could this possibly be true? Mark Higham switches on four different screens and tells you how they rate.

If you use your ST regularly and seek to invest in a monitor or want the added convenience of being able to use all ST modes on a single monitor, there are various options available to you – at a price.

Alongside normal monitors there's a breed called multisync. The principle of multisync monitors is that they can sense the vertical and horizontal scan rates of the incoming signal and adjust themselves accordingly. This feature was originally designed to cope with the multiplicity of different graphics standards and on the IBM PC but it has spin offs for the ST.

An ST running into a multisync monitor is able to display all three modes, including the monochrome high resolution output. Though the output is superior to the standard Atari monitors, there are often compatibility problems. You need to buy yourself a special lead with a switch mounted in it to flick from colour to monochrome modes (contact Lightwave on 051 630 5003). Flicking the switch causes your ST to reset so you can't retain programs or data. While a multisync monitor cannot beat the superior quality of an Atari high resolution monitor, it produces a display which is far superior to colour monitors.

If multisyncs are out of your price range and you're currently using a television to display output, there are enormous advantages to be had in investing in either a colour or monochrome monitors.

If you make heavy demands on word processors, DTP packages or many of the professional-quality music packages, Atari's monochrome monitor is your best bet. These are capable of an exceptionally high quality display which is useful for regular work where you need to keep a close watch on the display.

Of course for games and many educational packages, you can't do anything without a low-resolution monitor. Although high-resolution monitors produce quality output in black and white, the vast majority of games cannot run with them. Atari sells its own colour monitor capable of displaying low and medium resolution screen displays to overcome this problem. The output isn't of such a high quality but in many cases a colour monitor is essential.

SM124/5 MONO MONITOR

EVESHAM MICROS • £119 • 0386 765500

Bundled with many of the professional Atari ST packs, the monochrome monitor is the preferred choice for most business applications. It is capable of displaying the 640 X 400 pixels offered by the ST's high-resolution mode, however it cannot be used with any other screen resolutions.

Two wires of the monochrome monitor are connected together to act as a switch informing your ST that a high-resolution monitor is connected. If you pull the monitor plug out of your machine, the ST instantly re-boots. This is annoying, particularly if people regularly walk past your machine and accidently knock it out.

Atari is the only company to produce a monitor suitable for high-resolution work (excluding the multisyncs) so it's the only option. However, at such a reasonable price, it's an excellent choice.

SC1224 COLOUR MONITOR

EVESHAM MICROS • £279 • 0386 765500

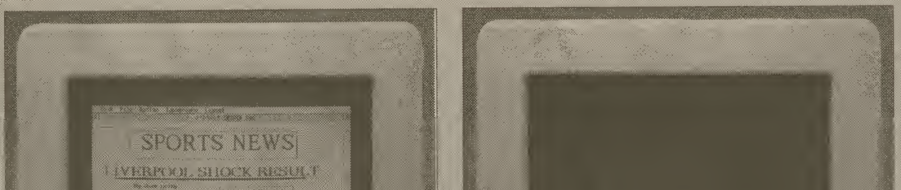
If you find you cannot read text on a high-resolution monitor or you want to see more distinctive colours on your screen, then a low-resolution monitor is for you.

The SC1224 is the official Atari colour monitor. It's slightly longer than the high-resolution monitor and comes with a single lead which extends directly out of the back and fits into the ST's monitor port – so you need to invest in the special leads required for use with other non-standard colour monitors.

The SC1224 tends to darken screen output more than other monitors but this is only because it produces a resolution superior to its colour contemporaries. Since many games tend to be designed on other monitors, this can be a problem in games which are already dark, making some areas almost invisible. The SC1224 also has a highly-reflective surface making it annoying to use in very light areas.

If you can afford it, the Atari colour monitor is the definitely the one to go for. It's capable of producing an output which is far superior to cheaper colour monitors and this easily outweighs any disadvantages it might have. If the Atari colour monitor is out of your price bracket, shop around. There are a number of other colour monitors available at a cheaper price which, with the correct leads, can be used just as easily.

PUT YOURSELF IN THE PICTURE



• The official Atari monochrome (left) and colour monitor (right) look identical but they perform an entirely different task. The mono monitor has a high resolution and is ideal for desktop publishing and word processing work, though you can't run games on it.

QUADRAM MS1420 MULTISCAN

£399 • SILICA SHOP • 081-309 1111

This is an extremely large multisync monitor which dwarfs a Mega ST. It comes with controls hidden under a panel on the side and dip switches for colour selection on the back. It's mounted on a swivel and tilt base with an etched screen for minimum glare.

Although this monitor claims to be able to automatically switch between low and high resolution output, in practice it's necessary to adjust the vertical hold each time you change over.

The colour display is exceptional with increased clarity and very little curl at the corners of the screen. The high resolution 0.31mm dot pitch tube gives a pixel sharp display which is much clearer than the Atari units. You need to invest in a suitable switching lead such as the MVDU-211 from Lightwave.

This is a superb multisync at a reasonable price. Games have a distinctive arcade-quality result and for high-resolution work it has the kind of non-reflective display which makes it a equally as impressive.

KAGA TAXAN MULTIVISION 770 PLUS

TAXAN • £746 • (0344) 484646

This is a top of the range monitor with all the options you would expect from such a price. It features an etched screen, numerous controls and a high resolution 0.31mm dot pitch. It accepts analogue and digital input from the ST but it doesn't seem able to hold the ST's screen display accurately. Consult your dealer before buying and he should be able to remedy this by making a few internal tweaks with the potentiometers.

The monitor also comes on a swivel and tilt base to help you adjust it to suit your position.

It produces an excellent clear, sharp picture with clearly defined colours, though there is some sag in the top centre. This is the ultimate choice if you have the money – lots of it. ■

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AMIGA ADD-ONS

Though it is remarkable in its basic form, the Amiga can be stretched to amazing limits with its mass of expansion options. Damien Noonan looks at what to use, how to use it and what effect it will have.

• Hard disk drive: There's not a lot to separate competitors in the A500 hard drive scene, but the GVP Impact Series A500Plus is almost completely idiot-proof and looks classy.

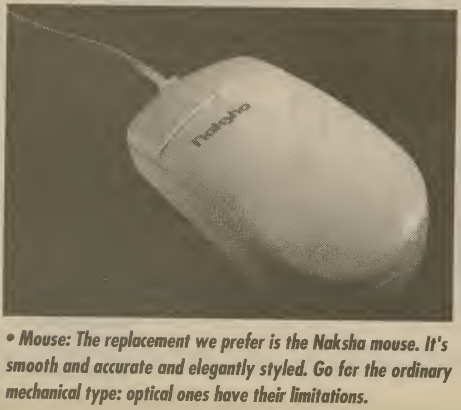
The Amiga is not only a remarkable machine in its basic incarnation – it is also capable of being stretched to limits that make even the most advanced professional computers seem relatively weak. The basic A500 might seem to have all the advantages already, but as a home computer it is capable of extraordinary expansion.

An extra 3.5-inch disk drive is just the beginning – the A500 can accommodate RAM expansions up to a massive 8 Mb as well as taking on board 68030 processors that can make it one of the fastest of the 16-bit generation. But for the low-down on what extra hardware you may find useful for your purposes, from alternatives to the mouse to different central processors, read on.

THE UPGRADE PATH

Improvements to your basic hardware are covered by the generic name 'upgrades'. Some of these are mundane, if incredibly useful in application. The first hardware upgrade you are likely to consider is simple enough: it is likely to be a new kind of joystick, if you play games a lot, or a new kind of mouse if you prefer serious applications and your original Commodore mouse is beginning to show its age. There are all sorts of alternatives, many of which you may not even have considered.

The first dive into the insides of the Amiga you are likely to want to make is if you have an older Amiga and are using Workbench 1.2. If you want to move on to Workbench 1.3, with its extra facilities and relatively bug-free operation, you will have to fit a new Kickstart chip.



• Mouse: The replacement we prefer is the Naksha mouse. It's smooth and accurate and elegantly styled. Go for the ordinary mechanical type: optical ones have their limitations.

The next most accessible upgrade is likely to be a second 3.5-inch floppy disk drive. This is an obvious choice if you play a lot of games: you will no doubt have encountered two, three or even four-disk games that would be made considerably easier if you could ignore those "Insert Disk 2 in any drive" prompts and just get on with the game. A second disk drive is almost a must, however, for any serious user of the Amiga: operations as simple as copying the contents of one disk to another are made so much quicker and easier if you merely have to copy from one drive to another.

ELEPHANT MEMORY

The next upgrade option, and again one which will prove useful for games as well as serious use, is the addition of a RAM expansion. The obvious first step is to purchase an extra half meg (half a megabyte = 512K) which will bring your machine into line with the one megabyte standard required to get the most out of some games. Remember that the Amiga is a 512K computer: it comes with 512K of RAM ordinarily. This can usually be expanded in steps of half a megabyte (512K) at a time.

One megabyte in total – the basic 512K plus a 512K RAM expansion – is the most required by games. The purpose of adding more, however, is to help out with applications that use a lot of RAM memory, which in the main means complex graphics and sound programs. Games which take advantage of a one megabyte machine, for instance, will show improvements in either the graphics or the sound effects.

If you are trying to get the most out of your machine in the graphics department and are still using a television via the modulator, it will certainly be worth considering an upgrade to a proper monitor by this stage. If you already have a standard monitor, you may want to get hold of a newer, more sophisticated one.

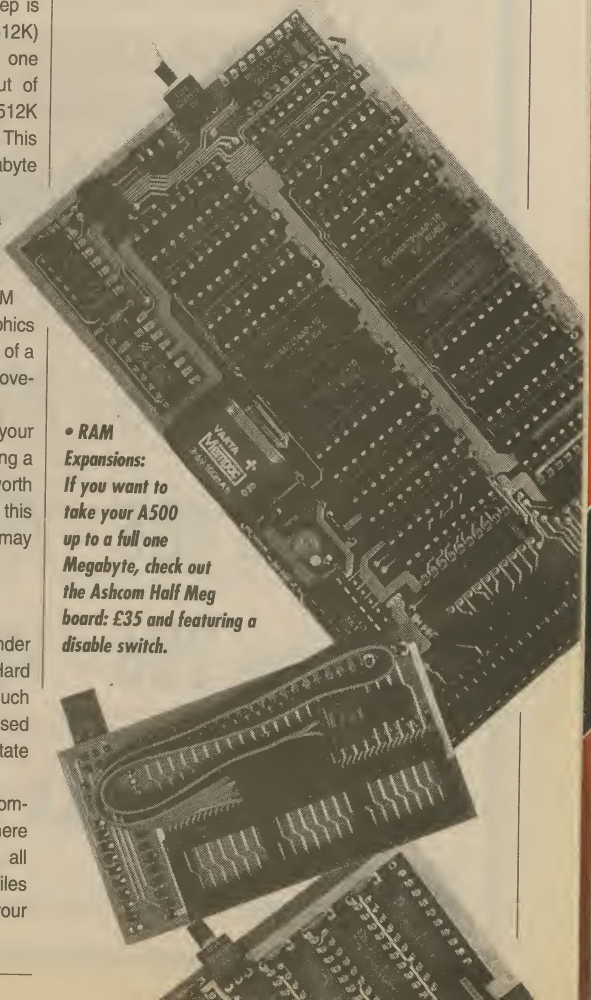
PROFESSIONAL STANDARDS

Next step up, to turn your machine into a real contender in the professional use stakes, is a hard disk drive. Hard drives are, as the name suggests, composed of much the same magnetic medium as floppy drives, but based on a hard, solid and much larger disk which can rotate much more quickly, allowing faster disk access.

Hard disks can store vast amounts of data, common sizes being 40Mb or 80Mb as opposed to the mere 880K on a floppy disk. This means you can store all your commonly-used programs along with all the files you produce on the one disk, as well as your Workbench and your boot-up stuff.

Finally, the most sophisticated upgrade you could possibly wish for is a faster central processor, upgrading from the standard 68000 to a 68020 or 68030. These usually come complete with a second chip, a maths co-processor, and they improve the speed of any operation making intensive use of mathematical calculations. This is of greatest benefit to speed up complex graphics operations, such as surface mapping and ray-tracing. ■

Damien Noonan is editor of Amiga Format *magazine. These articles are reprinted from his book,* Get the Most Out of Your Amiga, *available from Future Publishing Ltd, The Old Barn, Somerton TA11 7BR. It cost a very reasonable £9.95.*



• RAM Expansions: If you want to take your A500 up to a full one Megabyte, check out the Ashcom Half Meg board: £35 and featuring a disable switch.

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THE PD COLUMN

Adam Waring tells you how you can teach your kids a thing or two, solve the Times crossword and produce high quality documents, all for just a few pounds.

Match-Words • Amiga • Amiganuts • Disk 899

Crossword buffs will love this one. The disk comprises three programs, each using a central word database designed to help you solve all those irritatingly impossible crossword clues.

Make-words will find all combinations of a word that carry a sequence of letters in certain positions. Effectively it fills in the gaps for you. For example, if the clue was something to do with the army, and the letters you had were 'b****cks', you would enter these letters and the program will list all the words with letters in this order including 'buttocks' and, of course, the one you need, 'barracks'.

You can use the second program on the disk to find words within words. Type in a selection of letters, and *Match-Words* will tell you every word that can be constructed using all, or any, of them.

The final program, *Match-Anagrams,* is used for working out anagrams. Type in a sequence of letters, and the program lists any words that use the same letters, only in a different order.

STOSedit • ST • Trust PD • COM 001

Word processors are useful things. You can save your work to disk, edit it and print as many copies as you like. *STOSedit* is a word processor written in the BASIC programming language STOS. There are a number of options available such as search and cut and replace.

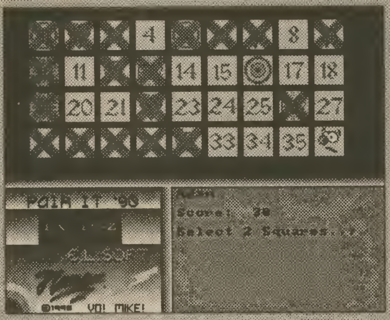
Obviously it doesn't have all the advanced features you'd find on expensive commercial programs, but then again, it's only a couple of quid.

Micro Care 'A' Series – Disk 1 • ST • Trust PD • COM 003

If your kids need to be taught a lesson or two, then this could be just the program to do it. It's a very basic educational program covering simple spelling, maths and shape recognition.

There are a couple of maths tests. In the first addition, subtraction, multiplication and division skills are tested. All these numbers are a bit boring though, so you can move swiftly on to the second maths tests, where the dull digits are replaced by nice little pictures instead.

Pair It • Amiga • Amiganuts • Disk 910



• *Flip the tiles and match the pairs in Pair It.*

This is another of those 'match-the pairs' games which seem to be so popular at the moment.

An array of tiles lie face down. You and another player take turns to flip them over two at a time, revealing the symbols on their top-sides. If they match, they are removed from play, and you have another turn. If not, they are turned back over and it's your opponent's go.

The idea is to memorize which tiles had what symbols on them. Then, when you flip a tile with a previously uncovered symbol, you can immediately pick its partner and carry on. Of course, it's not as easy as that unless you have a near photographic memory.

You can choose the type of pictures displayed on the cards, the difficulty of the games depending on how similar the symbols are. To make things even more difficult, you can elect to have the tiles shuffled after a set number of turns, so that you will have to remember a whole new set of patterns.

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If your kids have no problem with maffs, then perhaps it's their spelling that needs brushing up. The spelling tester should sort them out. It displays a picture of something along with the word that describes it. Then the word disappears, and you have to spell it out. The words are things like 'sun' and 'heart' rather than 'metempsychosis or 'psittacosis'.

Lotto is a shape association game. A card is marked with six objects. Another appears at the top of the screen. If it's the same as one on the card, then the image should be dragged to its corresponding picture. If not, it has to be chucked in the bin.

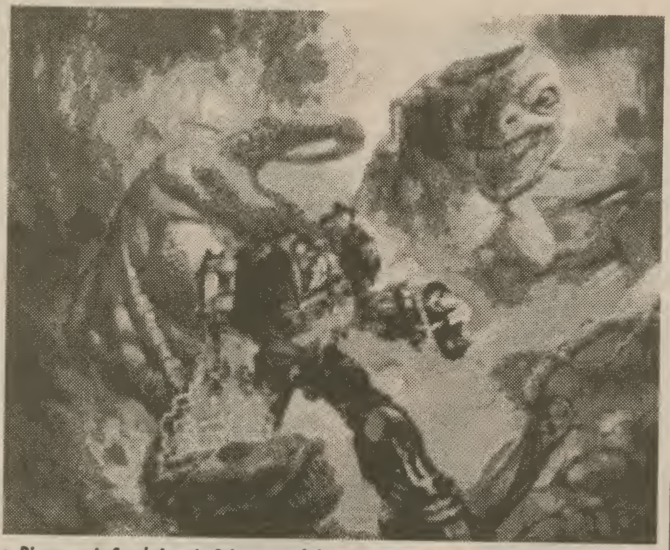
Not having any children of my own, I was unable to test the program on the lesser developed minds it was designed for. Instead, I tried it out on myself – and got nearly all of them right.

The Disk (issue 1) • Amiga • Stephen Lord

The Disk is a brand new disk-based magazine for Amiga owners crammed full of useful utilities, as well as not so useful demos from many fish disks.

The idea is to create a user group to help others with all aspects of computing on the Amiga. As a special introductory offer, the first issue will set you back a incredibly cheap 70p. ■

Future Visions • Amiga • Lorenzo's Domain • Disk 323



• *Dinosaurs in South America? Just one of the stunning scenes from* Future Visions.

Exhausted, she can run no further. Her clothes are torn, she's bruised and out of breath. The only thing to do is hide.

In the snow and icey wastes of Mexico, a snow transporter makes its way through the inhospitable climate. And it'll be worse in winter.

Caught by surprise! A group of adventurers are ambushed in a forest. But they regain their wits quickly; it's going to be a long and bloody battle.

Future Visions is slide-show of amazing Amiga artwork. Taking the form of a series of static, but nevertheless impressive, full colour pictures it features the kind of illustrations you will normally find on the cover of any science fiction novel. Take a look and see what you think.

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THE DISK
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Available on: Amiga, Atari ST, IBM PC 3.5" & 5.25". Amiga, Atari ST, IBM PC screenshots.

GAMES WEEK

Neil Jackson gives you the low-down on the latest new games, playing tips, cheats and news.

There's a distinctly nautical air about this week's batch of previews for some strange and inexplicable reason. It seems that everyone's busy releasing or planning games that have something to do with water, islands, piracy (of the seafarin' kind) or merchant ships. US Gold is first up, announcing the imminent release of Lucasfilm's ***Secret of Monkey Island.*** It's labelled as a comedy, set during the first "golden age" of piracy in the Caribbean. You play the hero, fresh from the old world (presumably jolly old Blighty) on a hilarious swash-buckling search for the fabled ***Secret of Monkey Island.*** What you do with it when you find it is unknown, and you'll have to get the game to find out. ***Secret of Monkey Island*** is due to hit the streets right now for the ST, PC and Amiga.

The next watery (but by no means wet) release is from movie-mogul Palace. ***Crystals of Arborea*** is set on an island, the only uncovered part of a submerged land. Hidden within this island sanctuary are four magic crystals, or at least they *were* here! Morgoth, Lord of Chaos, has broken free and now stalks the surface of Arborea, bringing nought but death and destruction. It's odds on that he's got something to do with the disappearance of said crystalline objects. And so it falls to you to rid the land of his menace and return the stones to their resting place. ***Crystals of Arborea*** is a Simarils/Palace release and it features strategy and role-playing in a beautifully illustrated three-dimensional world. Out for PC, ST and Amiga in April.

Still more seaborne flotsam and jetsam bobs along from Impressions, which is announcing the release of ***Merchant Colony***. This simulation recreates the British attempts at colonial rule during the nineteenth century. As a loyal British subject, your job is to raise the dosh for a ship, and set sail for pastures new and people to subjugate. You can just trade with foreign nations, but (as history reveals) this is far too easy. Much better to wade in and colonise them, claiming their resources, employing builders for thruppence a year and founding cheap factories to churn out even cheaper goods for the Mother country. If you hearken back to the times when British thuggery was the order of the day, this might be for you. But then again, perhaps not! ***Merchant Colony***, out now on ST and Amiga, could be the most unsubtle launch of 1991, given the current situation in our Middle Eastern ex-colonies! Queen Victoria is 154 years old. ■

TOP 10 SIXTEEN-BIT GAMES

THIS WEEK	LAST WEEK	CHART WEEK	TITLE	PUBLISHER	MACHINE
1	1	9	*Speedball 2*	Mirrorsoft	ST AG
2	3	29	*F-19 Stealth Fighter*	Microprose	ST AG PC
3	2	4	*Final Whistle*	Anco	AG
4	5	5	*Steve Davis World Snooker*	CDS	ST AG
5	7	54	*World Class Leaderboard*	Kixx	ST AG PC
6	6	43	*Treasure Island Dizzy*	Codemasters	ST AG
7	RE	17	*Barbarian 2*	Kixx	ST AG
8	RE	9	*Powermonger*	Electronic Arts	ST AG
9	11	2	*Team Suziki*	Gremlin Graphics	ST AG
10	16	5	*Arkanoid 2*	Hit Squad	ST AG

For the week ending 9th February 1991
ST = Atari ST AG = Commodore Amiga PC = IBM PC or compatible OT = Other
Chart compiled by Gallup. © European Leisure Software Publishers Association.

PLAYING TIPS

Midnight Resistance

Amiga and ST

There ain't no stoppin' us now...

Thanks are due to *ST Format* reader, Lee Mansfield from Surrey, who kindly sent in this complete solution for Ocean's arcade shoot-'em-up. Take it away, Lee...

LEVEL ONE

Easy peasy. Just make sure you stay on top of the jeep until you reach the scaffolding. The rest is like taking candy from a sleeping baby, whilst armed with a loaded M16 and several grenades .

LEVEL TWO

Buy three-way bullets and homing missiles from the first shop you come to. If you haven't got enough dosh, buy a shotgun instead. Beware of grenade-throwers on this level – they are the only major threat. When you reach the machine-gun nests, lie down above the central one, and fire down at him. The rest can be shot at from here. At the moving floors, shoot diagonally in the opposite direction.

When you reach the end of the level, where the missile-launcher lives, just get underneath it and fire while standing on the dustbin lid.

LEVEL THREE

Buy more three-way shots and homing missiles, if you can. If you have enough cash get the barrier too. At the first machine, lie down and keep firing at it. It may hit you, but usually you can dodge it. At the rising platforms, get on the middle left one,and keep firing in one direction. When you get to the Scuos fire left and keep firing until they're all dead. Only use the homers if you can't handle the pace. When you've only got four left, wait for the baddies to come down and then go and stand in the left corner, firing along the floor. Then fire the homing missiles straight up, to kill the big Scuo before it gets you. Stay put and fire at the second blade as it comes across the ground. When the eye fires at you, use two homers to destroy it.

LEVEL FOUR

If you're already tooled up, get a life (an extra one!) Your best chance comes in the shape of a three-way shot, and it'll get you to the planes easily. Then use your homers as you jump into the planes.

LEVEL FIVE

Take your pick of the goodies in this shop, as this level's easy. When you get to the helicopter just keep shooting homers at it until it dies. When you reach the electric man go down as far as possible, wait until the screen gets to the floor and then jump down, in between the bullets and kill said chappy. Be sure to shoot the electric beams first.

LEVEL SIX

Get more homing missiles or your chances are slim. Fall down the first floor, shoot the medium-sized blade and lie down. Keep shooting! At the next drop, face the baddy and shoot him. Remember to kill the ones behind you with homers. Following this, there are four more blades and more men, coming at you in pairs.

LEVEL SEVEN

More homers! As the ship passes, keep moving, and firing homers. Get the guns in the middle, then the rocket launchers.

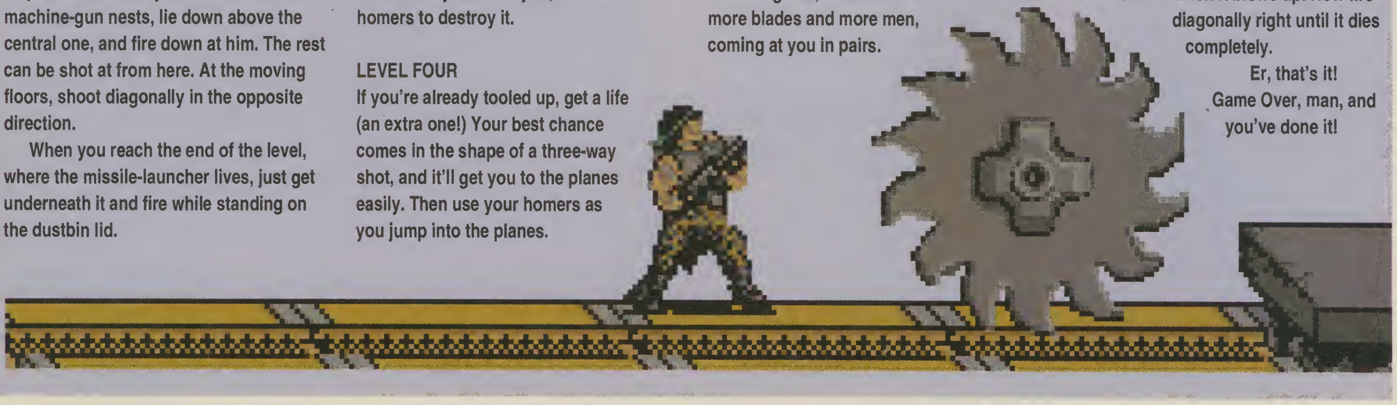
LEVEL EIGHT

Climb any ladder, and shoot six yellow men to get six keys. At the top, keep firing. Jump over the caterpillar when it hits the deck. Kill it and then shoot the skull before climbing the rest of the way.

LEVEL NINE

If you have six keys, you can jump up and get every item as well as releasing all the hostages. Shoot the faces as quickly as possible. When you reach the head, fire diagonally at it and run across to the left corner when it blows up. Now fire diagonally right until it dies completely.

Er, that's it! Game Over, man, and you've done it!



THE ATARI ABC

Now, there's a PC-AT compatible that not only solves problems like other AT compatibles, it also solves the one problem that its predecessors have created ... affordability.

Silica Systems are pleased to present the new Atari ABC. The ABC is a 286 AT compatible that runs at over 5 times the performance of the IBM XT. This is achieved by combining the power and speed of a 16-bit 286 processor, with Atari Corp's development experience and engineering capabilities, which use the very latest in design technology. However, the Atari ABC's are available at 'XT prices' and many XT owners will wonder why they paid more, but got less!

The ABC is a reliable, high performance computer, built to exceptionally rigorous standards. It is well designed, to a state of the art specification, maintaining maximum expansion capability for the future. This includes up to 4Mb of RAM and 3 AT expansion slots. Plus, unusually for a PC at this price, the ABC has the ability to install two or three extra drives, with the cabling already inside the CPU.

The ABC has a host of impressive features, all built-in as standard, encouraging simple installation and ease of use. In addition, the ABC's small footprint and quiet operating, mean that you will notice it less on your desk than other PC's. Except, of course, when you begin to take advantage of its AT power.

At its remarkably low price point, the ABC is ideally suited for home, office and educational use and will take full advantage of the vast range of PC compatible software. And, with 12 months FREE on-site maintenance (8 hour response), you can rest assured that your ABC will be fully supported.

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Swivel on this...

S.W.I.V.

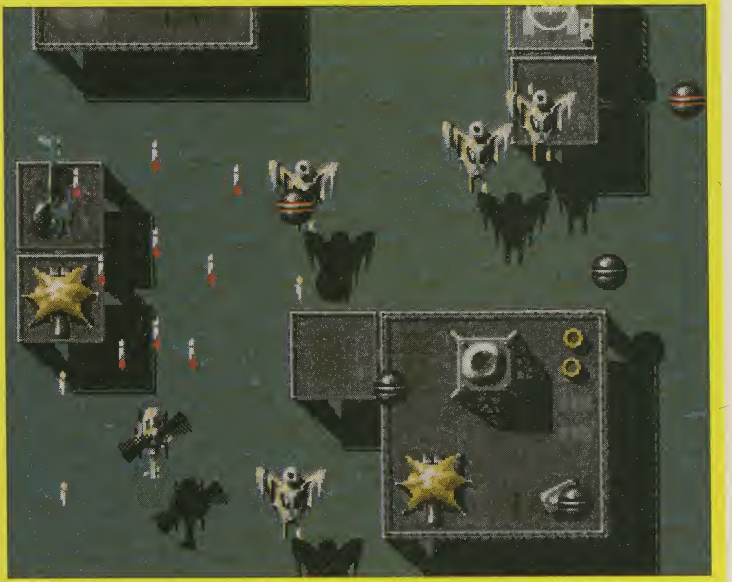
Storm • Amiga and ST • £24.99

Diehard shoot-'em-uppers will remember (with some fondness) the spectacular *SilkWorm* which set new standards just under two years ago. Now it seems that Storm is set to do it again, with its home-grown sequel, *S.W.I.V.* This is an acronym for Special Weapons Interdiction Vehicles, an elite assault team which uses helicopters and armoured jeeps to do their dirty deeds. In a fashion similar to that of *SilkWorm*, you have the option to control either of these two machines, but that's really where the similarity between the two games ends. *SWIV*'s main difference (and its best feature) is that it's a vertically-scrolling game, rather than a horizontal one. This gives a much better chance to the poor sucker who's decided to be a jeep-jockey rather than a fly-boy, due to the increased "dodging" area which comes with the wider and taller screen.

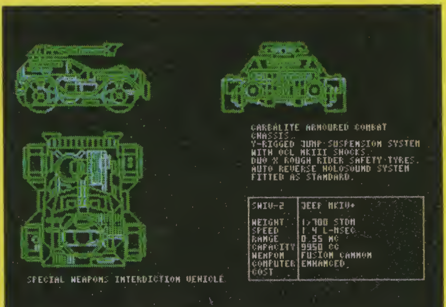
SWIV's objectives are clear, concise and fairly self-evident. Get into enemy territory, destroy as many secret installations as possible, wreak as much havoc on enemy vehicles and planes as you can and don't get killed. There's really little else to do, but this doesn't mean that *SWIV* is by any means repetitive or boring. Far from it. Your concentration is stretched to the limit as you try and cope with the myriad different enemies, all using some form of firepower or other, plus the stationary targets which have a habit of becoming ultra-defensive, just when you're lining up for the kill.

In the midst of this mayhem, there is some order. The game is fast-paced, and doesn't conform to the standard "level one, big baddy, level two bigger baddy" ethos. Instead, it uses a tailor-made dynamic loading system, which loads the next level while you're still playing the last quarter of the previous one. So there are no end-of-level guardians or predictable watersheds, instead, middle-of-level muthas and inter-guardian guardians make life irregular and rather trigger-happy.

The whole game comprises 106 screens-worth of varied playfield, which is divided into 16 different zones. These zones represent such odd places as the Ghost Town, Desert (gulp), Airstrip, Jungle, Lava field and Sci Fi zones. There's even a cornfield section, complete with a giant craft which rises up, pops a plasma pulse and leaves a familiar looking circle in the wheat below. Corny or what? Is it some kind of cereal killer? Who knows? You're unlikely to spend long pondering this one, as yet more missiles are busily heading towards your position. Keep moving and stop thinking, and you might (just might) make it to the next zone. But, of course, there's no breathing space, just more continuous action.



• SWIV's helicopter is undoubtedly the best way to travel, even though Silkworm's original concept has been improved to increase the gameplay for the jeep driver. But it stands to reason, though – why drive straight into trouble when you can fly right over the top of it?



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SWIV-2    | JEEP MKIV+
          |
WEIGHT    | 1,700 STON
SPEED     | 1.4 L-MSEC
RANGE     | 0.55 MC
CAPACITY  | 9950 CC
WEAPON    | FUSION CANNON
COMPUTER  | ENHANCED
COST      |

SPECIAL WEAPONS INTERDICTION VEHICLE
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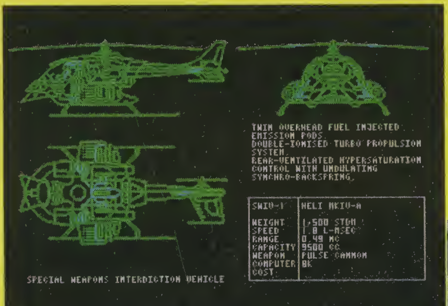
• *A hard car to drive and jeep at the twice the price.*



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EMISSION PODS.
DOUBLE-IONISED TURBO PROPULSION
SYSTEM.
REAR-VENTILATED HYPERSATURATION
CONTROL WITH UNDULATING
SYNCHRO-BACKSPRING.

SWIV-1    | HELI MKIV-A
          |
WEIGHT    | 1,500 STON
SPEED     | 1.8 L-MSEC
RANGE     | 0.49 MC
CAPACITY  | 9500 CC
WEAPON    | PULSE CANNON
COMPUTER  | 8K
COST      |

SPECIAL WEAPONS INTERDICTION VEHICLE
```

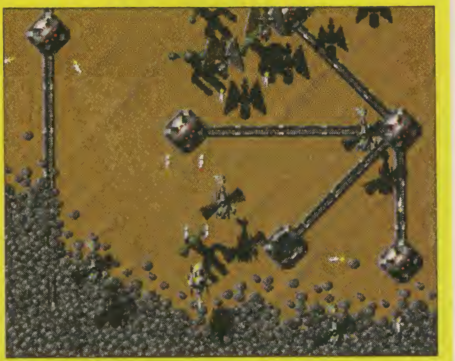
• *Take out your chopper and scare everyone away.*

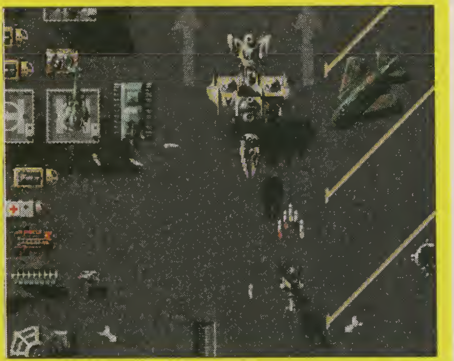
All this action is complemented by the kind of spectacle we've come to expect after *SilkWorm*. Shields and Smart bombs appear on the blown-out turrets of totalled tanks, which explode when picked up. The screen "whites-out" with a huge explosion, and leaves you pawing at the molten sockets where your eyes used to be! Massive goose ships assemble in mid-air, forming impenetrable barriers to your passage. Destroying these requires vast amounts of firepower, which is just what you can get. It's possible for two players to play at once, and if both of you are "tooled-up" there can be as many as 50 friendly bullets on screen at once. That's quite apart from the other fifty or so, plus tanks, guns, planes and laser pulses which all have your name on them.

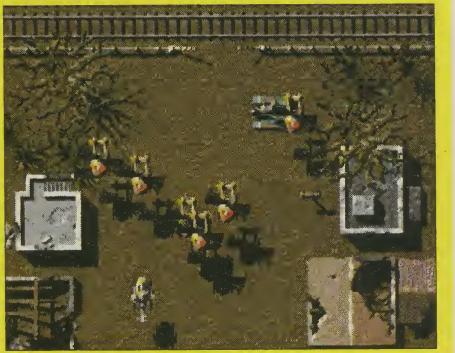
SWIV really transcends into another dimension when you pump up the volume. Undoubtedly the best sampled sound effects in any shoot-'em-up yet seen, it's thudding explosions, screaming plasma pulses and resonant ricochets are guaranteed to have you quaking in your boots or diving for cover. So real, you almost don't want to be there!

If *SilkWorm* spun you along for a while, *SWIV* is bound to keep you tied up for longer. Fast, furious, totally unrelenting and a real feast of ultra-violence, it's got to be just what the general ordered. Wimps avoid! Psychos do it here, and keep it off the streets!

• What would you do to improve a smash hit, side-ways scrolling, shoot-'em-up? Storm has taken the best elements of Silkworm and turned them on their head. SWIV is a fast, exciting and beautifully detailed vertical scroller, with ten times more action than its predecessor.







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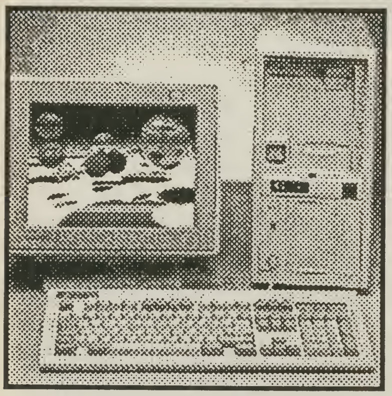

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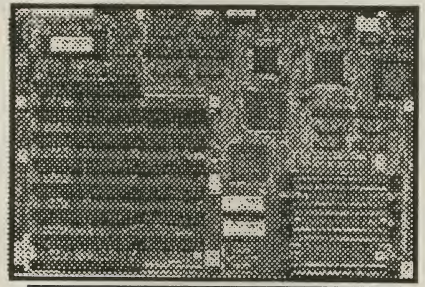

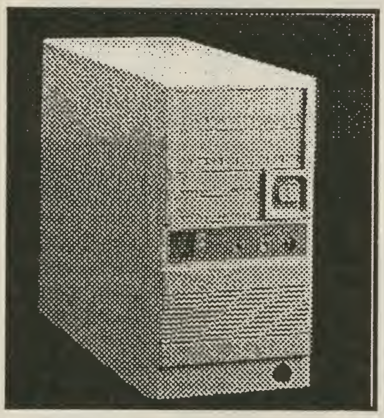

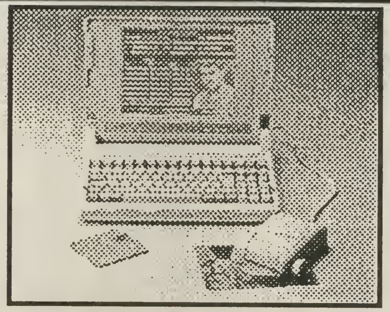

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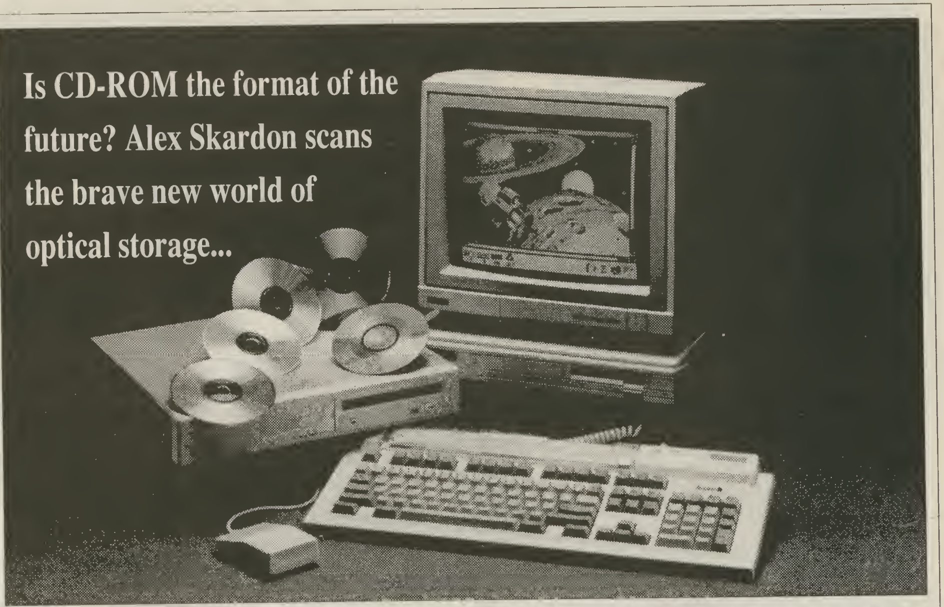


Is CD-ROM the format of the future? Alex Skardon scans the brave new world of optical storage...

Super Baby. Yes, Super Baby. That's the codename given to the next generation of Commodore's CDTV machines. So, CDTV hasn't even seen the light of a high street showroom yet, and rumours would presuppose it may still be some time coming, but already CBM's development engineers have named the new baby and its Christian name is Super. Why Super? Full frame moving video is why.

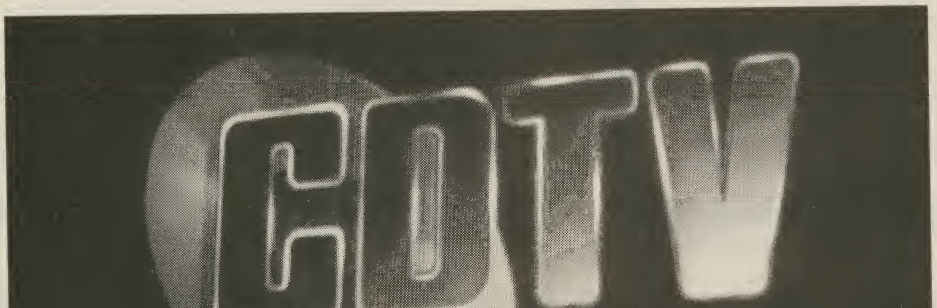
CDTV as we have come to know it may be one thing, but the likes of Intel's DV-I and Philips'/Sony's/Matsushita's CD-I are already on-line and threatening to take over the market before CDTV even has a chance to get underway. Throw in Sony's recent deal with Nintendo over a new interactive CD format and you can almost sense the fear permeating through CBM's boardrooms. And now it would appear that the remotest rumours reckon that even Amstrad has a CD-PC waiting in the wings. Everybody's getting in on the act so who looks like winning the Oscars?

Obviously Commodore thinks it has a greater than even chance. 80 per cent to be precise. Or so some surveys would claim. They reckon that by the end of '91 there will be something in the region of 200,000 CD-ROMS in the UK – most of them in the home.

Given that Dixon's, Curry's, Comet, and Kay's will all be box-shifting the CDTV unit, volume sales would seem to be assured. Throw in some lucrative rental deal with Radio Rentals and Granada and you're talking giga-mega-bucks. Add a Commodore badged Amiga CD-drive add-on for less than £400 and even the dullest of the 16-bit software houses is going to be sleeping soundly in their beds at night knowing their MDs can afford a naff new Nissan.

SEIZING THE POTENTIAL

But does Commodore have the dough? That's the BIG question and let's remember that when you're talking domestic devices you're talking massive overheads in advertising, promotion and public perception. Look at Apple. It's had a CD-ROM drive out since late '88 but has the software spun past at the speed of a laser pickup? Well, sort of...



A study conducted by the Optical Publishing Association of America recently concluded that by 1992 there will be nearly 11,000 titles on CD disc worldwide producing sales of 8.5 million units running on 3.5 million machines. To put that growth in perspective, there are currently just over 800 commercially available titles with nearly 90 per cent of them running on PC compatible systems. So why is such massive growth predicted?

Well it's quite simple really. CD-ROM, and all its derivatives including CDTV and CD-I, promise virtually unlimited storage space at a much cheaper price per byte than the floppy. OK, so they're read-only, but then you use them in conjunction with a hard disk for your data files. After all, you look at the average hard disk in use anywhere – it's full of fixed read-only program files. They may as well be cast in stone. And anyway when was the last time you wanted to store 72 minutes of moving video or 24 hours of orchestral music on a floppy, or for that matter, a hard disk?

MOVING PICTURES

The golden egg though is not just the amount of storage space a CD-ROM represents. Because CD-ROM isn't a storage medium – it's a distribution medium. It's not even the ease with which great swathes of text can be searched and collated. Neither is it the opportunity to digitise 24-bit colour stills or 16-bit sampled sounds, link them together and provide the ultimate encyclopaedia. Nor is it, God forbid, the half a gigabyte shoot-'em-up or flight sim with solid 3D fractal landscapes. No, the format all the major manufacturers are working towards is full screen, full motion video. Why should this be? And why should it be inevitable?

We only need to look at Intel's DV-I system for the answer. Supported by IBM and Microsoft, Digital Video Interactive is a set of compression algorithms burnt into a chipset which compresses and decompresses full motion video in realtime. So with this code on a card it's possible to squeeze up to 72 minutes of moving video onto a single CD-ROM. A typical CD is 650 Mb. Yet a typical frame of TV quality video, 1/30 second's worth of motion, occupies 720K. As such, one second of digitized video would consume over 22 Mb of storage space. A standard CD-ROM with 650 Mb and a data transfer rate of 150K per second could therefore hold only 30 seconds of video and would take five seconds to display a single video frame. But after four years of

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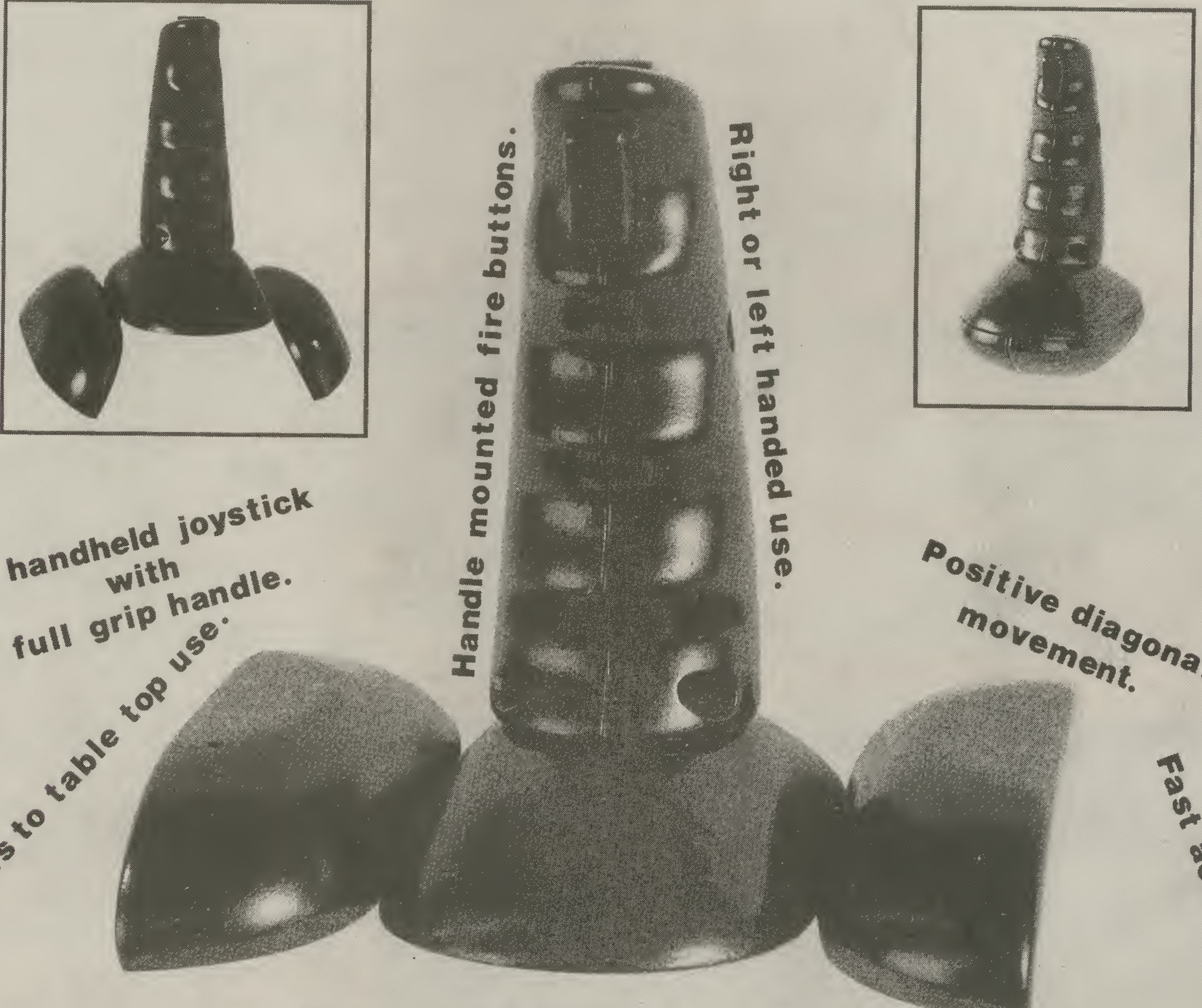
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research, the software algorithms underpinning DVI technology will allow the data representing only 4.5k for each frame – an incredible compression ratio of 160:1.

As such, a standard CD is now able to store 72 minutes of motion video which it is able to replay at the full 30 frames per second. If this weren't enough, any combination of different media can be combined on a single standard CD-ROM – up to 44 hours of audio, 650,000 pages of text and 40,000 still images.

FUTURE APPLICATIONS

The applications and implications are immense and far-ranging. It's goodbye to the laser disk at a stroke. Interactive training, video databases, information systems, realtime video games, broadcast video editing, travel software. But since we're dealing with a new form of publishing why not say the entire back catalogue of the most popular BBC wildlife documentaries. Moving video sequences which can be paused and linked to other educational resources such as diagrams, graphs, voice-over and text?

Commodore's Super Baby, if and when it arrives, will almost certainly use DV-I technology to offer such goodies. High resolution, 16-bit colour still images with file sizes of 1.2 Mb could be squeezed down to 188K in less than half a second. Philips' rival CD-I system is also moving towards offering full motion video with a chipset developed by Motorola. So the race is on. The winner will be the one with the most cash backing. If Commodore can get CDTV out into those high street stores ahead of the competition it just might pull it off.

APPLE PIPS

Let's face it. Everyone would love to see CD-ROM as the format of the near future. It can typically deliver over 650 Mb of any kind of data from computer files to classical music to Hollywood cinema and some drives even promise a gigabyte. But it's a chicken and egg situation as with all new platforms. And nowhere is this more painfully pointed out than in the Mac world where very few companies have produced CD-ROM products precisely because very few punters have bought the damn drives. Therefore sales are sluggish, therefore publishers' output even more so. Full circle.

Nevertheless, over 50 CD-ROM titles for the Mac, ranging from massive 720 Mb PD compilations to £4,000 DTP disks of over 600 different Postscript fonts to Beethoven's 9th Symphony to the graphic adventures of Cosmic Osmo, now grace the platters of nearly a dozen different CD-drives so the Apple platform is beginning to look rosy.

THE CD-PC

Whilst always moving a little behind Apple in the innovation stakes, the IBM world is perhaps the ideal platform for CD-ROM products since it forms the world platform for corporate users. And who else needs more access to the kind of data the format offers than the corporate?

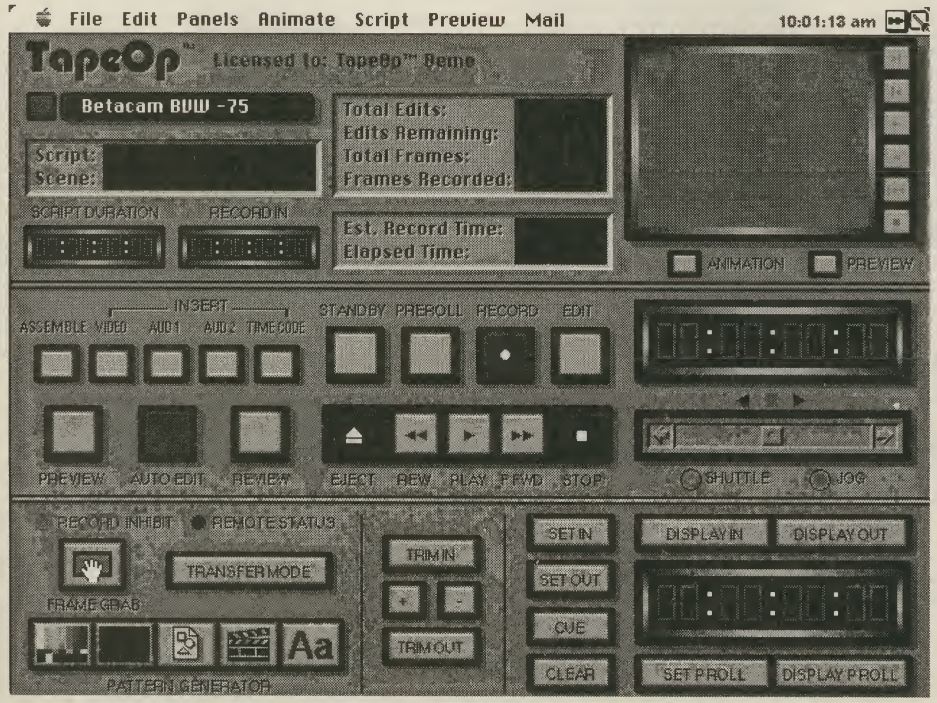
This then is reflected in the number of titles available for the PC which now runs firmly into the hundreds. 1991 directories list over 1400 titles compared to half that number last year. Clearly, there's a burgeoning market which forward thinking publishers realise is tomorrow's opportunity.

While at present these tend to be dominated by technical reference materials like programming libraries, parts catalogues and encyclopaedia, there are stacks of shareware CDs out there all waiting to be perused. While searching and loading what may typically be any one of 16,000 files residing on a CD-ROM might be more daunting for the PC user who doesn't have Windows than his Mac counterpart, the range of titles at his disposal is growing at a faster rate.

But you really need speed and memory expansion to get the best from the format. At least a 386SX or souped up 286 because CD-ROM drives aren't very fast, so you'll at least want the satisfaction of running that file quickly once you've waited for it to load.

THE DEATH OF MAGNETIC MEDIA?

So is this the end for the hard disk? The answer has to be no. Not yet. Hard disks now top the 1000Mb storage level so it's difficult to see the conventional advantages of CD-ROM. Whether you can buy a 1 gigabyte hard disk for around £500 remains to be seen though. As does the answer to the question 'How else could you distribute programs of several hundred Megabytes?' Even with the proposed 25Mb floppies being developed in the States it would still be a bind to distribute software this way. Until eraseable optical drives become common place, and therefore cheap, magnetic media will hold its own though. But as more and more software is released on CD formats, optical storage devices will begin to dominate. ■



• Could this be part of the front-end of the future once DV-I technology finds its way into your desktop CDPC?

CD-ROM: THE COSTS

PC

For PC Compatibles, stand-alone CD-ROM drives made by Hitachi, Toshiba, Philips and NEC will, for the most part, cost you around £600 to £700 complete with interfaces. Hitachi's CDR1600S at £595 and Toshiba's KT2200S at £640 can be considered best buys. However, Reeves recently announced a complete system based around a 386SX with a Sony drive for £1,499 complete with colour VGA monitor and 3.5-inch floopy. If you want to dabble first, companies like CD-Fiche on 0293 525271 will rent you a stand-alone CD-ROM drive for £25 per week or a complete system for £75. Internal systems are also available for up to £100 less than these purchase figures.

Software-wise, the best source of PC CD-ROM softare in the UK is CD-Fiche but CD-ROM disks, on all platforms, tend to be expensive. The cheapest start out at around £70 and go all the way up to £700 plus. An essential CD to get if you plan to buy one of the recommended Hitachi drives is the Nimbus Toolbox. This £90 disc includes utilities to integrate sounds, music and speech into your own requirements. You can compile your own sentences, audio testing signals and telephone dialling tones as well as convert your drive into a mouse driven audio CD player.

MAC

For the Mac, NEC's CDR75 at £534 is the cheapest drive on offer, but with new drives like the Sony CDU-80001 from Apple itself at £610 and Toshiba's XM-2200A at £640 offering faster seek times, these might be a better buy. For software, the best source of Mac CD-ROM discs in the UK is Kimtek on 0202 888873. In the US, the Bureau of Electronic Publishing on 0101 201 808 2700 is your best bet.

AMIGA

Hardware wise there's nothing available as yet other than the A690 CD-ROM drive from Commodore due later this year for around £400 and the much awaited CDTV expected to retail for £699. Meanwhile, for Amiganuts CD-Fiche publish a CD-ROM called Carousel for £195 which contains over 13,000 PD programs for the Amiga, PC and Mac.

ATARI ST

Of course, Atari's had a £399 CD-ROM drive for the ST available for a couple of years now, but you try finding anything to run on it. Where Commodore's been canny is in persuading games software houses that there's a whole new market out there for the CDTV consumer. Atari never had such luck. But it would seem Atari might yet profit from being too quick off the mark. At the recent Las Vegas CES, the company were showing a CD-based console to selected developers. No name or specifications I'm afraid but watch this space.

ARCHIMEDES

Acorn badges a CD-ROM drive for £750 which offers offers a 0.4 second average access times claimed to be twice as fast as competitors. Besides being compatible with CD discs from other machines using the High Sierra and ISO 9660 formats it also supports the fledgling CD formats of CD ROM XA, DV-I and CD-I making it an upwardly comatible system.Also, Next Technology on 0223 420222 has developed a CD-ROM pressing facility so that user originated software can be permanently transferred for less than £300.

Data can be imported from floppy disk, DAT cassette, 35 mm slides, photographs, VHS videotape, Video 8 or microfiche. MS-DOS and Apple file formats are also supported.

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a) Capt James Biggleswor th
b) Kerry Packer
c) Freddie Laker
d) Frank Whittle

2) What 1960s fighter plane, described as years ahead of its time, was scrapped because it was unmarketable, and saw the re-incarnation of some of its features in the latter day Tornado and Jaguar military aircraft?
a) The Fokker Friendship
b) F4B Phantom 2
c) TSR2
d) Sopwith Camel

3) What does ATC stand for in the Tower FRA game?
a) Arabs take cover
b) Air Training Corps
c) Air Traffic Control
d) Amanda Trumps Casually

4) Which of these is the odd one out?
a) Westland Whirlwind
b) Pride of Dover
c) Aerospatiale Dauphin
d) Bell Jetranger 2

5) Which of these places doesn't have an airport?
a) Blackpool
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MEMORY CARDS

Portfolio can store and retrieve data and programs from its own RAM, or from small credit card size memory cards, that slot into its built-in card drive. The cards are available in three sizes, 32K, 64K and 128K, so you can carry a library of data in your pocket. The card drive also accepts ROM cards, which can contain commercial or custom software.

POWER SUPPLY

Portfolio is powered by three AA batteries which will run for up to six weeks with normal use, or from the mains using an adaptor. All the peripherals take their power from the Portfolio, so no extra batteries or adaptors are required. A 'battery-low' warning and memory back-up ensure that information is not lost when the batteries are changed.

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Portfolio can communicate with other computers and supports a growing range of peripherals via a built-in 60 pin bus connector. Peripherals available include serial and parallel interfaces and memory expanders (to 640K). You can also add a card drive to your desktop PC, to enable it to read/write to Portfolio's cards.

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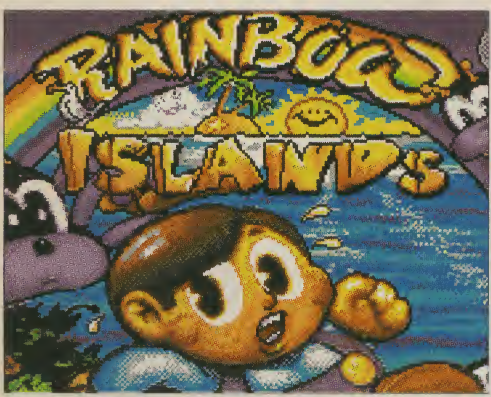

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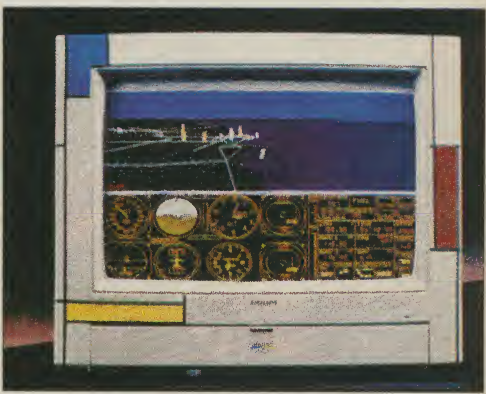
The Amiga family



Hardware

RATED: THE BEST HARDWARE FOR THE AMIGA

Welcome to the *New Computer Express* Amiga Guide. This is the fourth of our free supplements and,as the title suggests, it is entirely concerned with things Amiga.

Some people may quibble that the inclusion of CDTV errs from this strict machine-specific line. These are the people who don't know what lurks at the heart of Commodore's new dream baby. Read on and those of you included under that description will be in for a pleasant surprise.

We have tried to include only the best products, and pieces of the best information for the subject matter. Of course *Express* itself carries out more in-depth analysis of this, and every section of the computer market each week.

Basically, we hope that the next 30 pages will provide Amiga owners with a few moments of pride and advice. Non-Amiga owners may well have their minds changed too!

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Commodore Dynamic Total Vision. We look at the specifiactions, and give some background on CD-ROM. Make up your mind with facts not speculation.
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Play fair

Time to have some fun. But of course we won't waste your time with the dross. We bring you the very best in Amiga leisure. Shoot and think.
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WIN! WIN! WIN! WIN!

Your chance to win one of the most popular games ever made for the Amiga. 10 copies of *Powermonger* are going begging for the price of a stamp.
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HAPPY FAMILY

Neil Davey begins an expert rundown on what's what in the wide world of Amiga.

Although a lot of people want an Amiga the first time they see one running, not very many are fully aware of the options available. The Amiga comes in five basic flavours, each with its own particular strengths and weaknesses, and a varied range of expansion options.

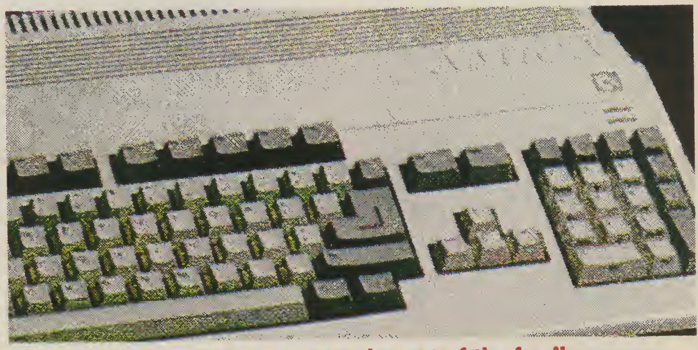
All the computers come with the same operating system, apart from the 3000, and all use more or less the same chips, being based on the Motorola 68000, with a trio of custom graphics and sound chips. The Amiga is a wonderful thing, being a creative person's daydream in the sound and graphics departments. You can hear the almost CD-quality sampled sound in stereo through the speakers in your monitor or through your home hi-fi. The high resolution graphics can be rendered in any of four or five different resolutions, and in anything from 2 to 4096 colours. All the computers come with an internal disk drive, mouse, keyboard and two disks containing the graphically oriented operating system called Workbench, and AmigaBASIC.

The operating system, called AmigaDOS, is a multi-tasking OS, meaning that given the right amount of memory, the machine can run many programs at once in complete safety. And most important of all, the Amiga now has a software base in both the commercial and public domain sectors unequalled by any machine save the PC. If it continues on this upward slant, it could be the most successful and popular computer of the decade.

A500

The diminutive A500 is the baby of the family, although its facilities are by no means limited. The unit is an all-in-one affair, having the keyboard stuck on the front of the case, and the internal disk drive on the right hand side. There are ports on the back for RGB out (to the monitor), parallel, serial, external disk drive, and audio left and right.

Although the A500 is often pitched as the games machine of the family, it has as much graphics and sound power as the 3000. Although its memory capacity and processor speed is limited to start with, it can be expanded to a very high spec computer. As far as emulation goes it can handle as many formats as the larger machines, and accepts MIDI interfaces and any kind of printer from a dot matrix to a professional imagesetter. Desktop publishing is possible on a small scale, although expanding the memory is essential for larger documents. What you have in the A500 is an excellent starter machine, and the base of operations for a range of creative and business applications – almost as many as you can think of.



Turn to page 14 to meet the rest of the family ...

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HARD WORKING

Amigas are versatile machines able to do more than just play games. Given the right peripherals, even the humble Amiga 500 will turn into a high-powered graphics workstation or an on-line system among other roles. We drafted in Cliff Renshaw, technical editor on sister publication, *Amiga Shopper* to recommend a range of essential add-ons for your machine. Read on for the best of the bunch ...

Hand Scanners

The GeniScan GS4500
£149.99
From Datel Electronics
Tel: 0782 744707

Whether for DTP, computer art, or fun, hand scanners provide a cheap way of transferring graphic images to your Amiga.

The GeniScan GS4500 works with all Amigas (specify which when ordering). It connects to the serial port. Although a monochrome device, the scanner achieves up to 16 grey levels by dithering. It has a scan width of 105mm and a choice of resolutions from 100 to 400 dpi, selectable by a four-way switch. Other controls include a brightness thumb-wheel; a start button; and another four-way switch to select between grey-scale settings or monochrome, the latter being useful for scanning line drawings or text.

The GeniScan: everything you need for a nice little scan.

The scanner works in conjunction with Amiga Handiscan 3 – bundled software that allows editing and saving of captured pictures in IFF format. This enables transfer to a DTP package or more sophisticated image manipulation using your favourite paint package (*Photon Paint* is included free with the package). The scanner compensates for skew arising from a case of the DT shakes, making the scanning process surprisingly painless.

Ease of use: 8/10

Pointing Devices

The Naksha Mouse
£29.99
From First Choice Computers
Tel: 0532 637988).
Naksha: Tel: 0925 56398

Perhaps your mouse has given up the ghost, or maybe you're cheesed off with it and want a change: either way, there is a wide variety of pointing instruments to choose from. Trackerballs, although excellent for speedy movement across a screen-full of windows, can create difficulties when used for high definition work; and graphics tablets are a little too expensive and specialised for most applications. Personally, I prefer a good old-fashioned mouse. Optical mice need a special mat, and cordless mice, as well as having to be within 45 degrees of their receiving units, stand little chance of transmitting a signal across a cluttered desk.

The Naksha mouse is one of the best available. It moves smoothly across the desktop, and with its higher resolution the accuracy will amaze those used to the standard Commodore mouse – ideal for painting programs. It fits comfortably under the hand, and has two well-placed buttons weighted to give a satisfying click.

Coming with a mat and its own 'mouse house' for storage when not in use, the Naksha mouse is a nifty, and not too expensive, alternative to Commodore's own offering.

Ease of use: 10/10

Floppy Drives

The Roctec RF332
£65
From State of The Art
Tel: 0742 700310

Any serious use of the Amiga demands a second disk drive. Having to continually replace the Workbench disk in your drive is extremely frustrating, particularly when working from the shell without enough memory to copy DOS commands onto the RAM disk.

The Roctec RF332, an attractive, slimline little number in a sturdy metal case, is a 1Mb device that gives a standard 880k on formatted disks. It comes with a throughport so that further drives can be added at the back, but care must be taken here since more than one external drive requires another power supply.

Also included is a disable switch. This is useful for those Amiga programs that will not work with a second drive connected, and saves you the bother of plugging and unplugging leads.

The drive comes with a manual explaining how to connect it – a simple enough operation. It is reliable and competitively priced.

Ease of use: 9/10

Monitors

The Philips CM8833-II
£249
From Gordon Harwood Computers.
Tel: 0773 836781).
Philips: Tel: 081 689 2166

The Philips CM8833-II monitor is the successor to the popular CM8833 model, featuring a 14 inch, flatter screen, and a sleeker design. The controls are more accessible too, inside a panel at the front.

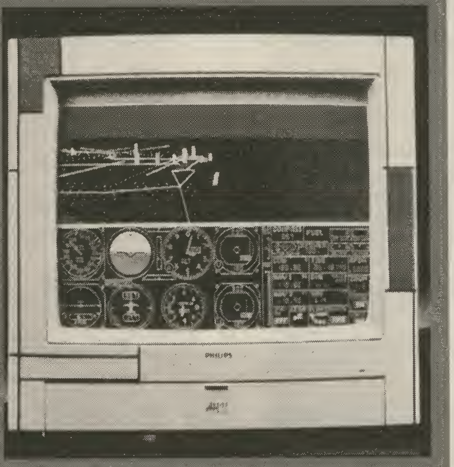
It is colour, of course, and even better still for those excellent new games soundtracks which are bound to start hitting the market in the very near future, it is also stereo. It works in both PAL - the UK standard - and NTSC - the rest of the world. As well as your Amiga, it can be used with a whole range of computers and will also connect to a video or display a TV signal (for this a separate tuner is needed).

Should you wish, there is a green screen button that lets you pretend you are working on a mini-computer or even a CPC!.

It comes with an adjustable stand that can be adjusted to give a viewing angle of 5, 10 or 15 degrees. There is an earphone socket for those times when you want to keep your latest music demo to yourself.

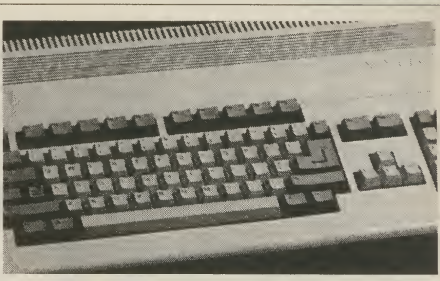
Gordon Harwood gives a free 12 month on site service warranty, and supplies the monitor with a free connecting leading. Getting a bright, crystal clear display could not be simpler.

Ease of use: 10/10



The Philips Artist series. Looks natty but it's only the CM8833/II dressed up in a Mondrian paint job.

HARDWARE



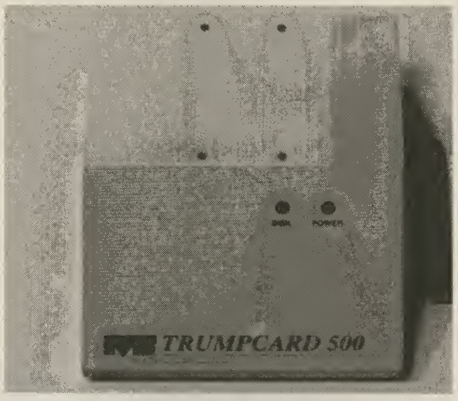
Hard Drives

The IVS TrumpCard 500 (50Mb, without expansion RAM)
£399.99
From Third Coast Technologies
Tel: 0257 472444

Hard drives are wonderful things. After using one for a while, you'll wonder how you ever managed with the speed and capacity of floppies.

The Interactive Video Systems TrumpCard 500 comes with either a 50 or 106 Mb disk fitted. It fits onto the expansion slot on the side of the Amiga 500. Unlike most others, it will also work with an A2000.

The metal casing is shaped to match an A500, but could hardly be said to be attractive.



The TrumpCard 500. Won't cost you millions.

Up to 5Mb of extra RAM can be added onto the board, making the expansion of your Amiga into a truly serious machine, an enticing proposition. The drive uses the industry standard SCSI interface, so others can be daisy-chained to it. SCSI also supports the addition of such things as laser printers and scanners.

The user's manual is clear and relatively jargon-free. Beginners shouldn't have too many problems. If they do, Third Coast Technologies have a product support line. The package includes 30 easy to use utilities for formatting, partitioning, disk checking and so on

Ease of use: 8/10

Modems

The Pace Linnet
£149.99
From First Choice Computers
Tel: 0532 637988
Pace Micro Technology: Tel: 0274 532000

market forces have decreed that, worldwide, more on-line services are opening up, offering facilities from straight conferencing, to commodity trading and even house buying! Fibre optics are speeding up data transmission beyond our wildest dreams. So, if you want to be on the mythical 'cutting edge' then a modem, and a good one, is a must.

Even now, a modem lets you transfer files to computers anywhere in the world (assuming they have a modem too), as well as access the numerous bulletin boards present in the UK.

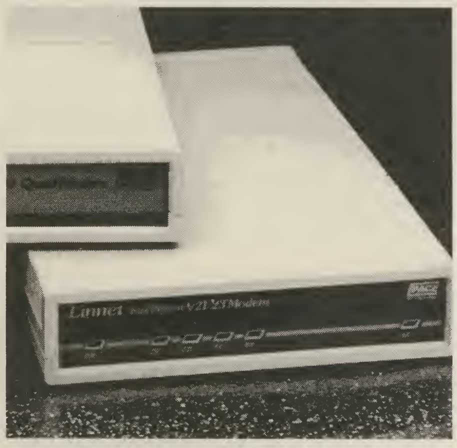
Pace produce the popular Linnet range of Modems. The entry level model is Hayes compatible, which is the command language used by nearly all modems.

It supports both V21 and V23 protocols, meaning transmission/reception rates of 300/300 and 75/1200 respectively. V23 is useful for talking to services such as Prestel, where most of the information is being sent to you, hence the high reception speed, and only the occasional key press is being sent the other way. This situation is reversed should you be lucky enough to have someone calling you.

The modem can store 32 phone numbers, which should save you some typing. It will auto-dial and auto-answer, and has an automatic re-dial feature.

There are six status LEDs on the front of the box to let you know exactly what is going on. It comes with an installation and user guide, but unfortunately you must get hold of some software from the Public Domain to actually use it. Access! will do the trick

Ease of use: 8/10 ■



Pace modems: we recommend you get in touch

Printers

The Star LC-10 - £159.95
LC-200 - £209.95
LC24-200 - £259.95 (mono), £299.95 (colour)
From Gordon Harwood Computers
Tel: 0773 836781
Star: Tel: 0494 471111

As we are all too well aware, the only machines which come with printers bundled tend to fall into two camps: there's the extremely expensive range of one-off deals which go to big corporations. Or there's the cheapy with the printer you can't wait to get rid of. Amiga owners have to go and look for their printers.

Having decided that a permanent copy of your work is required, there are a number of choices open to you. The obvious choice is a 9-pin dot matrix printer Why? Firstly because there are loads of them on the market, and secondly because they don't usually cost the earth.

Of those available the Star range is generally considered the best in terms of price and performance.

The Star LC-10 gives draft quality print at a claimed 120 characters per second (dps), and Near Letter Quality (NLQ) at 25 characters per second (cps) with a choice of four fonts. Beware – the official figures don tend to flatter the machines to which they apply, and a typical document, even a few pages of A4 with little fiddling around is normally printed at half the speeds given.

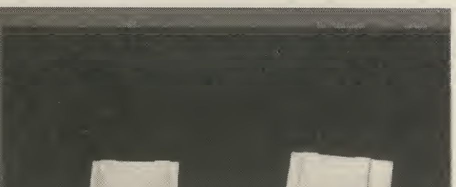
The Star LC-200 uses a three-coloured ribbon to give approximately 70 shades which, although not perfect, yields good results if the colours in your picture are well chosen. A black ribbon is also supplied. The LC-200 has more fonts than the LC-10, has a faster printing speed.

It also has a larger buffer, this is an area of memory built-into the printer which stores the text and configurations, allowing for blocks of information to be queued for printing. This acts independently of you computer. In short, the larger the print buffer, the less time your Amiga will have to spend looking after the data. Keep an eye out for sale bargain printers which come with the ability to take RAM extension cards.

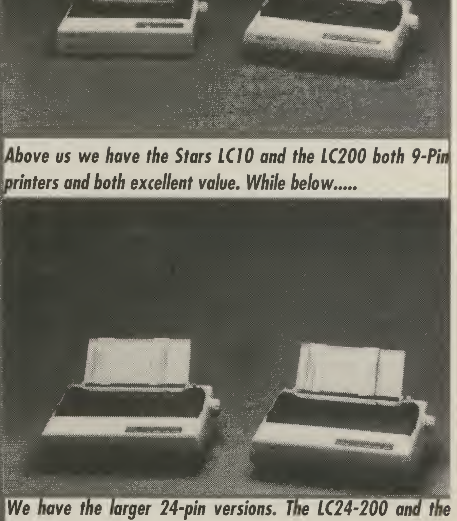
The LC24-200 will give you higher definition for your text (the number 24 is the number of pins on the print head - the more pins, the greater the definition), as well as offering yet more fonts and greater speed.

All of the printers have extensive controls on the front panel, excellent paper handling capabilities, and come with a free cable and dust cover.

Ease of use: 9/10 for all those printers mentioned.



Above us we have the Stars LC10 and the LC200 both 9-Pin printers and both excellent value. While below.....



We have the larger 24-pin versions. The LC24-200 and the LC224-200 Colour version.

WORKBENCH EXPLORATION

The Amiga's Workbench system was designed to be used, not explored. Pat McDonald, technical editor of *Amiga Format*, gives you a few insights on how to get into and look around.

When the Amiga was first being designed, the inventors had a problem. Designed as a multitasking computer – one that could run more than one program at a time – there was no cheap, available operating system that could be used to exploit the machine's potential. So they invented their own and called it Workbench.

The Workbench disk supplied with every Amiga is slightly misleading. Despite being almost full of data (approximately 860K) the command used for getting Workbench up and running is less than 3K long! What's the rest of it for – and how can you custom design your own?

Wake up

When the Amiga is turned on, the first thing it does is run some of the setting up procedures contained in the system ROM.

This is called Kickstart, and it has been updated from time to time. When it has finished all the internal checking procedures, it displays a hand inserting a Workbench disk – the version number displayed is not the Workbench version number, but Kickstart's.

On machines without a Kickstart ROM (like the original Amiga, the A1000) it first asks you to put in a Kickstart disk. Getting to the Workbench was a prolonged task on such machines, so Commodore decided to put all these routines inside the machine on a ROM chip.

Why isn't Workbench on a chip? Why do you have to load it from a disk? The main strength of the Amiga's operating system is that you can chop and change the way that the machine starts up – if you know what you're doing.

Four tracks on every standard AmigaDOS disk are used by the system for start up procedures. The most important of these is the infamous bootblock, the lair for viruses and custom loaders. On standard loaders, virtually all this contains is the word 'DOS' – the command to boot up the system as standard.

Once the system sees that word, it checks the devs directory for the file system-configuration. If it finds it there then it uses those screen size and colour settings, otherwise it defaults to 60 columns in the standard four colours: blue, white, orange and black.

After that, it sets up a new CLI process (an area where a program can work) and starts running the commands contained within the file startup-sequence in the s directory. If there isn't one there then it just stops with a prompt.

Changes

If you want to explore how Workbench works more, here's a quick exploration guide.

1) Whatever you do, **DO** make a backup of your Workbench disk. This can be done by clicking on the Workbench icon once with the left mouse button (to highlight it) and then selecting the duplicate option from the Workbench menu – to get at this, hold down the right mouse hand button and move the mouse to the top left of the screen. Oh, and make sure to have a blank disk handy.

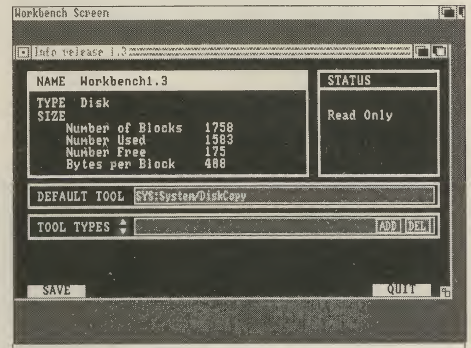
2) Now boot up with the copy, and keep CTRL-D pressed. This will abort the startup-sequence, and leave you ready to enter commands.

3) Enter the line ed s/startup-sequence and press return. This invokes a line editor (ed, who lives in the c directory) and gets up the startup-sequence on the screen.

4) By moving the cursor about with the cursor keys, you can view all the commands that Workbench runs before typing the startup-sequence. Have fun. To save any changes you make for experimentation, press ESC, then x, then return.

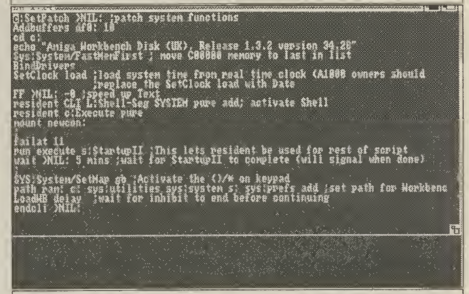
And finally

Two visual aids to a pair of handy Workbench facilities. Have fun and always work from legal copies. ■



NAME Workbench1.3
STATUS Read Only
TYPE Disk
SIZE
Number of Blocks 1758
Number Used 1583
Number Free 175
Bytes per Block 488
DEFAULT TOOL SYS:System/DiskCopy
TOOL TYPES

Above – Large INFO window
Info is one of the most useful facilities in Workbench. By clicking on an icon and then selecting it, you can see what type of icon it is (disk, drawer, garbage, project or tool) and also just how big it is.



```
c:SetPatch >NIL: ;patch system functions
Addbuffers df0: 10
cd c:
echo "Amiga Workbench Disk (UK), Release 1.3.2 version 34.28"
Sys:System/FastMemFirst ; move C00000 memory to last in list
BindDrivers
SetClock load ;load system time from real time clock (A1000 owners should
               ;replace the SetClock load with Date
FF >NIL: -0 ;speed up Text
resident CLI L:Shell-Seg SYSTEM pure add; activate Shell
resident c:Execute pure
mount newcon:
;
failat 11
run execute s:StartupII ;This lets resident be used for rest of script
wait >NIL: 5 mins ;wait for StartupII to complete (will signal when done)
;
SYS:System/SetMap gb ;Activate the ()/* on keypad
path ram: c: sys:utilities sys:system s: sys:prefs add ;set path for Workbenc
LoadWB delay  ;wait for inhibit to end before continuing
endcli >NIL:
```

Large TEXT window
Going to work on an Ed. The commands of AmigaDOS use the same format, most of the time: Command <space> Source <space> Destination. If you want to quit Ed without saving changes, then press Esc, Q and hit RETURN.

THE SYSTEM

If you're unsure of just what Workbench does and doesn't need, it would be wise to say what is on a standard AmigaDOS disk. There are five different directories which contain programs and data. In alphabetical order, these are:

c dir – The command directory. This contains all the programs which that particular AmigaDOS disk needs, including the LoadWB command itself. Without a command directory, containing at least this command you're never going to get very far.

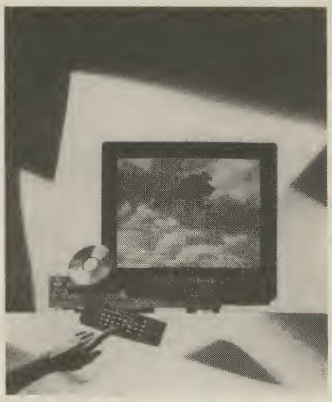
devs dir – Device directory. This commands all the device drivers, the programs to mount and control extra bits like hard drives, printers, screen display and non-standard external floppy drives. Also contains the file system-configuration, which is the file Preferences saves when you change the screen colours and size.

l dir – Handler directory. Used to control input and output within the computer, for things like controlling the screen (the CON handler) and sound (the SAY handler, for getting the computer to speak text).

libs dir – The library folder. Many standard programming tools are contained within, and some programs use these standard routines, rather than using their own code for jobs like floating point numbers.

s dir – Probably the most important area, the start directory. This has a file called STARTUP-SEQUENCE within it. This is a text file with a list of the commands to do. Typically it ends with LOADWB ENDCLI, to start Workbench going and end the startup-sequence.

CDTV FACTS



Commodore Dynamic Total Vision (CDTV). We move away from debate and hype, to look inside the machine which CBM hopes will bring multi-media to the masses.

CDTV looks nothing like the machine to which it owes the debt of life – the humble Amiga 500. Commodore has made certain of that. On the outside it is matt black and more akin to a stereo unit or video recorder.

There is no keyboard to worry the non-computer user. Why is this? Well, it has been 'proved' in various surveys, that the most frightening aspect of computing is not the awesome power which the machines give to users, nor is it the possibility of crashing mid-way through a highly important piece of work. No, the most terrifying piece of computer-related equipment is the keyboard. User-friendly CDTV comes with an infra-red remote control device. Even the mouse, if you purchase this separately, is remote control. So what makes the whole thing tick? What follows are the technical specifications for the machine which Commodore world-wide hopes will finally introduce multi-media to the masses:

Central Processing Unit

The core of the machine is the familiar Motorola MC68000, 16/32-bit central processing unit (CPU). The 68000 runs the CDTV at 7.15909 MHz for American NTSC systems. The British PAL standard sees the CPU charging along at 7.09379 MHz.

Memory

As is becoming the standard in the 16-bit computer market, CDTV comes with a standard 1Mb of chip RAM. This will obviously allow all of the new software which are coming out for the Amiga to be run on CDTV. 2Mb of non-volatile RAM (RAM which stores data even when you turn the machine off) accompanies this and deals with the system functions such as internal clock and user preferences. To top the whole thing off, or bottom it off depending on how you look at it, comes a half megabyte (512k) of ROM.

Operating system

CDTV is not pitched into the market as a computer, however Amiga owners will be more than familiar with Kickstart. CDTV requires Kickstart 3.1, which like, it's ancestor'sversion of the system, resides in ROM. Accompanying it to handle the leg-work is the ISO 9660 File System Handler.

Video Display

To get the most from the CDTV, you'll need a PAL standard monitor or preferably a good quality television set.The unit can cope with the following: 512 vertical lines at 50Hz frequency. The NTSC version is a measley 400 lines which should illicit a smidgeon of pride for UK users. A maximum of 1Mb chip RAM acts as dedicated video memory. As current Amiga 500 owners will be aware, this lot can handle a palette of 4096 colours on screen.

Compact Disc Specifications

This is the section which you have all been waiting for. The CD-based technology which is aimed at setting CDTV apart from the common-or-garden home computer. The only downside here is the fact that Read/Write Compact Discs are still in the realms of deep desire or straightforward lust for the home user, and even most professional users for that matter. Thus far in the evolution of the media you can read from the disc but not yet save anything yourselft. The only major optical storage media which can achieve this feat at the moment is the Write Once/Read Many times (WORM) system which is used by many companies for heavy storage and archiving.

CDTV makes use of Sony/Philips CD-ROM standards in both mode 1 and mode 2 (Red and Yellow Book). Reading from the drive takes a blistering 0.5 seconds. The average access time, according to Commodore, is ,on average, 0.3 of a second more at 0.8. Each disc has the ability to store 550Mbs of data which, again according to the official information, is equivalent to roughly 700 Amiga 3.5 inch disks (a box of 10 could set you back £13.95).

The audio-handling, which is capable of a variable sample rate from 44KHz to 6KHz, is based on the following specifications. 8X oversampling, 20-20KHz frequency response and a minimal 0.02% harmonic distortion running at 1KHz. Channel separation is a typical -92dB.

Nothing overly awesome, except maybe the concept of a computer as a family machine. As we have mentioned, the real turning point in CD-ROM technology will be when then the first budget (sub £500) priced WORM drive comes onto the market but that may not be as far off as it seems today. ■.

Compact Disc Read Only Memory (CD-ROM): A lesson in standards.

At the present time there are three recognised Compact Disc standards. Two were developed jointly by Philips and Sony, and are known as Red Book and Yellow Book. The other is the High Sierra standard which Apple Computers was involved with -it was named after the hotel near lake Tahoe in California the basis was agreed in 1986.

Red Book is the accepted standard for CD-audio and is the basis for both Yellow Book and High Sierra. It defines the methods by which data is written to Compact Disc; this takes into consideration the Synchronisation bytes, and error correction for each 'frame' (unit) of data. Using the Cross Interleave Reed-Solomon error correction method (CIRC) you would be unlucky to get more than one unrecoverable error in 2,000 Compact Discs.

Yellow Book is used in CD-ROM and is the standard by which CDTV operates. CD-ROM stores its data into blocks which read out from the inner area of a disc. Each block contains 98 frames, each frame is 24 bytes in size. Of these 2352 bytes, 2k are reserved for the user. Theoretically CD-ROM media can 75 blocks a second and have the ability to store 75 minutes worth of data – if this data were to be read back sequentially, obviously for multi-media projects which require non-sequential access this is irrelevant. In practice a Compact Disc is quoted as having 60 minutes worth of storage.

Error correction for Yellow Book standard machine is awesome. Not only is CIRC used but additional Yellow Book defined correction runs along side this. In fact along with each 2k block of user reserved data come 276 additional bytes of error correction. This is said to throw up one unrecoverable error in every 2 quadrillion discs! That's several million less curses uttered world-wide if the manufacturers and standard setters are to be believed. High Sierra is not used in CDTV, but is used in the Macintosh. We will not bother with it for now, but keep reading *Express* for details in future issues. ■

Any port in a storm

CDTV might is not be pitched at computer users, but one look at the back and you will see some very familiar sights indeed. What follows is a straight list of the ports which allow the machine access to the rest of the world:

Centronics/Parallel interface

RS232 serial interface (go on-line to Compact Disc-based BBSs, or even the standard form once the software has been designed)

External floppy disk drive. This is compatible with standard Amiga drives.

Mouse, joystick and keyboard port for those people who mistrust the infra-red remote control device or wish to use standard Amiga word processing tools, for example.

Two audio-output ports using RCA-type plugs. You need to feed the audio output through additional amplification such as your TV or stereo.

A MIDI In/Out port.

On the front panel you will find a stereo headphone jack and, helpfully for those people who don't wish to tinker with the machine, the port for an additional RAM car(up to 64k) is also found here.

Optional Extras

At the time of going to press, the following add-on devices had been announced by Commodore.

External floppy drive – this is Amiga compatible.
Infra-red trackball and mouse.
RAM and ROM cards
Genlock.
Keyboard.
Two player infra-red interface.
Modem.
And finally, a Printer

Ladbroke Computing International

12 Months On Site Warranty, featuring 24 hour response time is available as an option on all ST's for just £29.99 extra.

Please Read: Terms of Sale.

We are the longest established Atari dealer in the U.K. We have developed an extensive customer service policy which means that we test all Hardware/Software prior to despatch to ensure that goods arrive in working order. Although our prices are not always the cheapest we do endeavour to offer consistently good service and backup. This isn't just our opinion, we were voted "Best Dealer 1989" by the readers of ST World magazine, not for "the number of boxes shifted", but for quality service.

On Site Warranty: We have recently changed our backup programme by offering 12 months on site warranty as an extra with all ST's therefore giving the customer a wider range of options. We already offer on site warranty on all Star printers and Philips monitors listed at no extra charge.

All prices are correct at copy date 14/02/91, and are subject to change without prior notice. All prices are accurate while stocks last. Phone for up to date prices. All prices include VAT, there are no hidden extras (WYSMWYG). Delivery (in Mainland U.K) is free, on orders over £100 (add £10 for next day courier delivery. All prices available on Mail Order, Shop prices may differ.

Atari Packs

520STFM Discovery Pack	£ 279.99
520STE Turbo Pack	£ 369.99
1Mb STE Turbo Pack	£ 399.99
2Mb STE Turbo Pack	£ 474.99
4Mb STE Turbo Pack	£ 549.99
Plus pack: ten games, J/stick, Dustcover	£ 30
Lynx + California games	£ 129.99
Portfolio pocket PC	£ 199.99

Amiga Packs

A500 Batman Pack	£369.99
A500 Screen Gems	£369.99
Plus pack	£30

Includes Tenstar, Photon paint II, joystick, mouse mat

Service Centre

Diagnostic service £15

Our Engineers can repair ST's and Amiga's in minimum time at competative rates. We also offer a diagnostic service for which the customer is given a quote for the total cost of repairing the machine.

ROM switch + TOS 1.4 £49.99

This switch allows two sets of ST ROM's to be fitted to an ST and switched between to ensure compatability with all software. Machines must have TOS 1.09 in two ROM form. If six sockets are fitted, no soldering is required. TOS 1.4 (2 ROM's) and two extra sockets are supplied.

Exchange ST PSU's £59.99

We can offer fully compatible PSU's for ST's at this price in exchange for the damaged PSU. Our engineers can fit any STFM memory upgrades for £20. We can also fit SIMM's, TOS, Blitter chips, PSU's for just £10. Phone for details.

star Printers

Star LC-200 **£219.99**	**Star LC24-200** **£249.99**	**Star LC24- 200 Colour** **£319.99**
7 Colour printer	24 Pin printer	New 24 Pin printer
Colour + mono ribbon supplied	222 cps	222 cps
225 cps	5 Resident LQ fonts	5 Resident LQ fonts
5 Resident NLQ fonts	Accepts font cartridges	Accepts font cartridges
Bottom feed	Bottom feed	Bottom feed
Push or pull tractor feed	Push or pull tractor feed	Push or pull tractor feed
Paper parking	Paper parking	Paper parking

Star LC24/10	£209.99
Star Laser 8DB, 2Mb RAM	£1899.99
Star LC-10	£169.99
Star LC-10 Mk II	£189.99
Citizen Swift 24 pin	£319.99
Citizen 120D+	£139.99

All Star Printers carry 12 months on site warranty(Mainland UK). All printers include IBM Centronics cable. Phone for ribbons, paper and printer stands.

Monitors

Atari SM124 Hi-res Mono monitor	£ 109.99
Philips 8833 MK II Colour, Stereo monitor	£ 249.99
Cmdr 1084S Colour monitor * limited offer *	£ 269.99
Philips 15" FST TV	£ 269.99

The philips 15" FST Tv includes: remote control, Scart input, 60 tuner presets, sleep timer and Fastext. All displays include Scart cable. Deduct £10 from Monitors only, if bought with computer. The Philips 8833 comes with full 12 months on site warranty.

Trust PC's

AT 12Mhz Desktop	£449.99
AT 12Mhz VGA Mini tower 40Mb	£799.99
AT 16Mhz Desktop	£499.99
AT 16Mhz VGA Mini tower 40Mb	£849.99
386SX Mini tower	£699.99
386SX VGA Big tower CK66 40Mb	£1099.99
386SX-20 VGA Mini tower 40Mb	£1129.99
386-25 VGA Mini tower	£1194.50
386-25 VGA Big tower CK66 40Mb	£1599.99
386-33 VGA Big tower CK590 40Mb	£1699.99
486-25 VGA Big tower CK590 210Mb	£POA
Mono Monitor	£99.99
VGA Colour Monitor	£299.99

PC Emulators

PC Speed, XT Emulator	£99.99
AT Speed, AT Emulator	£199.99
ATOnce, AT Emulator	£199.99

Midistudio Master

- ☐ 100 tracks storage, 20 tracks playing simultaneously.
- ☐ 240 ppq resolution.
- ☐ Realtime mix-down via mouse,
- ☐ Realtime scrolling arrange window.
- ☐ 11 levels of quantise, including humanise.
- ☐ Pipeline/Module system.
- ☐ Loop record.
- ☐ Midi soft keys.
- ☐ Works on 1040STF(M)(E)

Master £129.99

Midistudio £49.99

Midistudio is a 20 track sequencer which can operate on a 520STFM(E), in medium res. Midistudio is an easy to use, low cost introduction to Midi music composition.

ST FAX/Modem

Now you can use your ST to send faxes. Uses a fully featured modem so you can also access Bulletin boards and commercial communication systems.

- ☐ Fully Hayes compatible modem
- ☐ Auto dial/ Auto answer
- ☐ 300/1200/2400 Baud
- ☐ Mix text and graphics.

Cannot receive faxes.

£200

Printer Buffers

- ☐ Connect up to 3 computers to a single printer.
- ☐ Stores files for printing leaving your computer free to continue working.
- ☐ Up to 256K storage RAM
- ☐ Copy switch to reprint most recent data.
- ☐ Multiple FP100's for 5 or more computers and a single printer.
- ☐ Internal memory check program

64K Printer Buffer £29.99

256K Printer Buffer £49.99

Ladbroke Computing

Low cost Hard Drives

We use only top quality, brand new, CDC or Quantum mechanisms.

We use American Military Standard quantum mechanisms in some of our Hard drives which are very high quality and come with a 2 year manufacturers warranty (from date of manufacture)

52HD- 52Mb 11ms

Uses Quantum drive **£419.99**

- ☐ Autoparking 3.5" mechanisms.
- ☐ Full metal case suitable as monitor stand.
- ☐ On/off button and DMA device selector mounted on front.
- ☐ Integral PSU.
- ☐ DMA Out port for daisy chaining.
- ☐ Megadrive controller, low power, controls up to 8 SCSI drives.
- ☐ Compatible with emulators such as Spectre GCR, AT Once.
- ☐ Up to 255 partitions, up to 1 Gigabyte in size.
- ☐ Selection of Accessories/boot partition with boot editor.
- ☐ Backup & utility software provided. Also includes Midistudio demo software.

New Prices

32Mb Supra drive	*Special offer £ 399.99*
84HD - 84Mb 24ms	*Special offer £ 549.99*

We can assemble any of above Hard drives with ICD boards which include a clock for just an extra £20.

Phone for other capacities

Peripherals

MCS Mouse (ST) 270 Dpi, microswitched	£ 20.99
Golden Image Mouse (ST or Amiga) 290 Dpi, microswitched	£ 20.99
That's a Mouse (ST and Amiga) 290 Dpi, microswitched, Switchable between ST and Amiga	£ 24.99
Contrack Ball (ST or Amiga) Trak ball	£ 34.99
Topstar Joystick	£ 23.95
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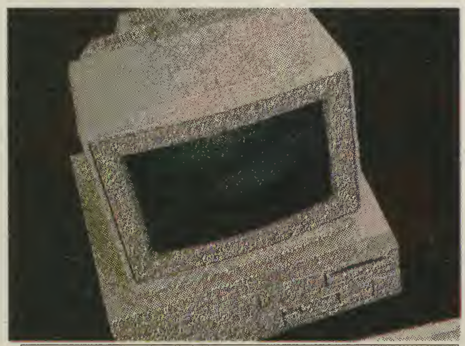
HAPPY FAMILY PART 2

In which Neil Davey continues his look at the whole Amiga family. Part 2 brings you the 2000, 1500, 3000, and some expansion options....

In the first part of this look at the Amiga family Neil Davey dealt with the baby, the Amiga 500. In part two of his exporation of the clan, he meets A500's bigger brothers, or sisters: the A2000, A1500 and A3000. There's even his perspective on upgrade paths and expansion possibilities.

A2000

The 2000 is a big box with a separate keyboard, containing essentially the same guts as a 500.



The Amiga 2000. Power and with ease of expansion

The major difference is that the big metal box can be opened like a PC to reveal the card slots for adding circuit boards to expand the capabilities of the machine. Although when you take it out of the packing the ports at the back of the machine are much the same as the 500, there are openings at the back of the unit, which allow other ports to be added using the card slots.

The processor is the same as the A500, as are most aspects of the motherboard inside the machine, but the A2000 can accept and upgrade to the faster 68020 and 68030 chips when you need them. This costs a small fortune, but improves the performance beyond recognition.

However, the A2000 has the added benefit of being able to run all software, as most accellerator cards with faster processors also allow a 'fall-back mode', letting you use the 68000 if you want to.

The 2000 comes with just one disk drive, but you can add hard disks and other bits and bobs until the cows come home. Or until the missus comes home at any rate! I would say that the 2000 is the optimum Amiga, allowing maximum expansion and possibilities for the least outlay.

A3000

The 3000 is a new breed of Amiga, containing a new chipset which heightens the available resolution, at the cost of the need for a multisync monitor.

The 3000 is the professionals dream machine, and is the top end of the spectrum. If you never play a game, then this is the one or you.

The 3000 also comes equipped with a faster processor, the 68030. The upside of this is tremendous speed, with many programs, especially DTP and graphics applications clocking in at over 3-5 times the speed. The downside of this is that the 3000 isn't 100% compatible with all software, due to differences between the 68000 and 68030 chips.

A1500

Part way through last year the 1500 was released. (Not to be confused with the Checkmate Digital 1500 which is an expansion/replacement case for a 500!) The unit is basically a 2000 with two drives and a monitor; a complete computer kit, as it were, ready to go.

The unit is just a 2000 with a sticker saying 1500 stuck on it, and even the manuals are 2000 manuals with an "and 1500" sticker on the front. A lot of stickers, but nothing else new inside. This machine is a very good starter pack, but if you intend to buy a hard drive at the same time then look very closely at the price of a component kit including a 2000. ■

AMIGA
1500
Personal Home
Computer

The Amiga 1500: a complete computer kit, ready to go.

Expansions possibilities

A2000/A1500 and A3000

Obviously the bigger machines have more scope for expansion, as Zorro card slots are ready fitted to the machines, allowing you to expand your machine off the peg as it were. There are memory cards which can boost your internal memory to 17Mb! All manner of other devices exist too, from hard cards to the new Readysoft Apple Macintosh emulator A-Max II Plus, which contains a couple of Mac serial ports.

There are other things you can do, particularly to the 2000/1500, in the way of popping out the processor and putting something else in its place. The ATOnce card is a 286 PC emulator, which runs as a task on the Amiga's multi-tasking screen. Another super add-on is the A5000 from Solid State Leisure, which pumps up your volume by adding a 68020 processor with fall-back mode.

A500

As the 500 is ostensibly a sealed unit, makers of peripherals have to be cleverer than makers of items for the card-slotted versions of the Amiga. So by and large the expansion options for the smaller Amiga are more bespoke. By far the best peripheral is the A590 hard disk, memory expansion and SCSI interface. This unit just plugs in the left-hand side of your Amiga, and gives you a 20Mb hard disk, a SCSI interface for any SCSI device like hard disks or laser printers, and enough room for an extra 2Mb of memory.

The A5000

The unit I mentioned earlier out also fits the 500, boosting the speed performance of the 500 way beyond normal limits, and adding up to 4Mb of 32-bit fast RAM. Also favourite is the Checkmate Digital 1500, a box which turns your 500 into a machine with a separate keyboard, and, using another box on the top, card slots too.

There are many memory expansions available, some of which fit internally, others of which use the trapdoor fitted into the underside of the 500 to just plug it. You can fit a 20Mb disk drive internally, and also 8Mb of memory. The trapdoor also comes in useful for PC emulation, as the KCS Power Pc emulator fits in here, a real PC inside your Amiga which turns it into a full spec XT. (Note that the ATOnce also fits in the 500.)

And just in from Amiga Centre Scotland is the new Bodega Bay, which alters your 500 by straddling it, forming a base for your monitor and adding the same expansion capabilities as a 2000, ie. a single power supply, card slots (of which some are IBM compatible), and space for 5.25" and 3.5" drives.

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For all repairs to your computer, one low payment covers diagnosis, repair (including parts and labour) and delivery back to you.

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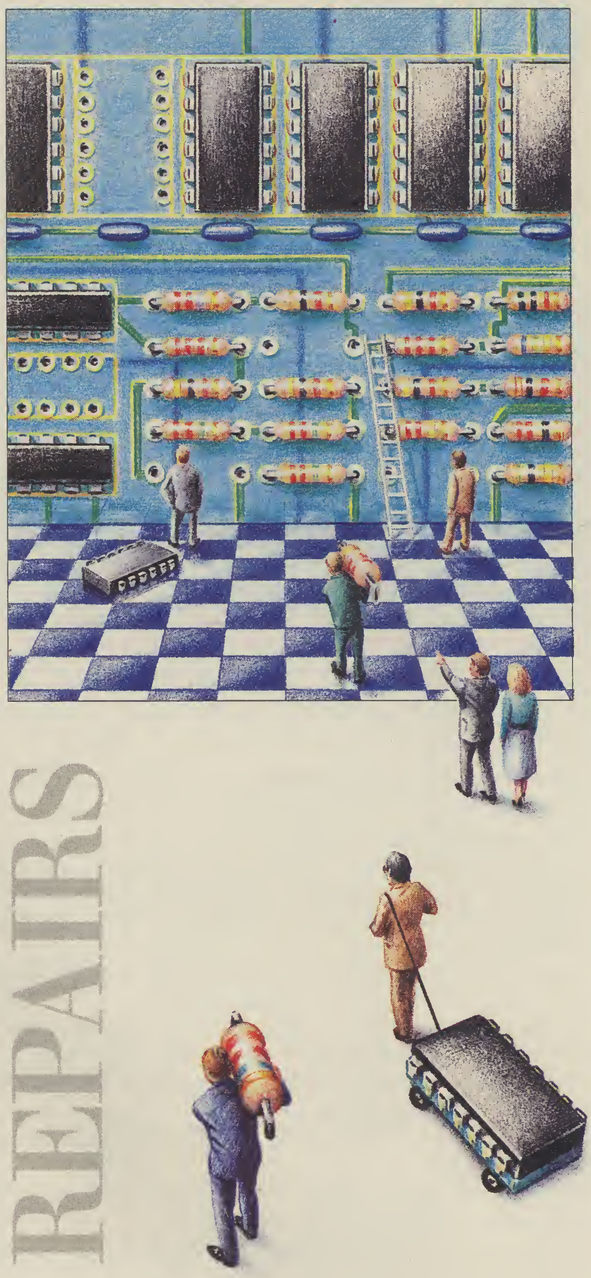

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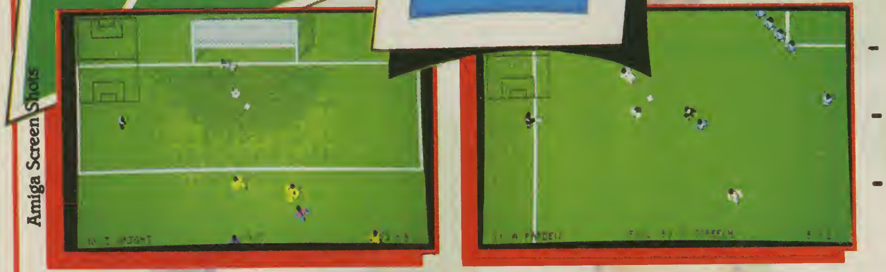

- BLISTERING PACE
- PIXEL PERFECT PASSING
- SUPERB TACTICAL GAMEPLAY

KICK OFF 2 greatly enhances the gameplay of KICK OFF, winner of the THE GAME OF THE YEAR in the U.K., and similar awards right across Europe. A host of new features have been added to the ones that enthralled players the world over.

- **Full size multi-directional scrolling pitch with the players, markings etc. in correct proportion.**
- **1 to 4 players option. (Amiga and ST only)**
- **2 players TEAM option against the computer or 2 other players. Hundreds of players each with a unique combination of attributes (stamina, pace, etc.) and skills (passing, shooting, tackling, etc.)**
- **Instinctive Kick Off joystick controls to dribble, pass, shoot, head or chip the ball and do sliding tackles.**
- **Set piece. FREE KICKS including dummies and the ability to dip the ball or bend the ball round a defensive wall.**
- **9 types of corner kicks with full control of shot power. Long and short throw ins.**
- **Team selection from a squad of 16 with substitution and a choice of tactics.**
- **League and cup competitions with Extra Time, Injury Time and sudden death penalty shoot outs.**
- **Facility to view, edit and save the Action Replays and create a Golden Shots disc.(Excl. IBM & CBM 64)**
- **Facility to load Player Manager teams and tactics for a single or league game.**
- **Red and yellow cards, 16 different referees, injury time and a host of features to create an atmosphere for a game which is real fun to play.**

ST ACTION - The best game ever to grace the ST. Highest accolade I can give.
AMIGA USER INT - The best computer game ever **97%**
THE ONE - Ultimate soccer simulation. **96%**
THE ACE - Brilliant. Buy, Buy, Buy. **930.**
AMIGA FORMAT - Best footy game to have appeared on any machine. **94%**
ST FORMAT - What a game! Gem to play. Magic. **90%**
C & VG - Championship winning material. **95%**
GAMES MACHINE - Probably the best sports game ever. **92%**
COMMODORE USER - No other footie game can touch it. **90%**
AMIGA ACTION - Surpasses all other football games. **93%**
POPULAR COMPUTING WEEKLY - Nothing short of brilliant.
NEW COMPUTER EXPRESS - Computer football event of the year.

AMIGA & ST £19.99 EXP. AMIGA £24.99
IBM (AT & XT Turbo, EGA & VGA) £24.99
CBM 64 - SPECTRUM - AMSTRAD £9.99, £14.99

Amiga Screen Sho

TACTICS DESIGN - RAW TRAC FACILIT

An International class player takes charge of a third division club as Player Manager. His brief is simple **-Bring Back The Glory Days.**

His success depends on his playing skills on the pitch and managerial skills in devising winning tactics, aquiring the right players from the transfer market and building a team worthy of the highest honours.

- **Unique facility to design and implement your own tactics.**
- **Over 1000 individual players, each with a unique combination of attributes and skills.**
- **A lively transfer market. Haggle for the best deal.**
- **4 division league and a cup tournament with sudden death penalty shoot out.**

The Player Manager brings the every day realities of a manager's life, his talents as a manager and a player, his triumphs and his failures into a sharp FOCUS.

ST. ACTION - A stroke of pure genius.
THE ONE - An exceptional football management simulation, Astounding depth. Most involved, rewarding and playable.
THE ACE - Successfully blends challenging soccer management with frantic end to end arcade action. **920**
NEW COMPUTER EXPRESS - The sheer depth is incredible. A definitive management game.
COMMODORE USER - At last a management game that requires true management skills - a winner. **94%**
ST FORMAT - Brilliant. **93%**
AMIGA FORMAT - Enthralling and addictive. **93%**
ZZAP - Best football management game ever written. **92%**

AMIGA - ST £19.99

MENSION IN
IMULATIONS

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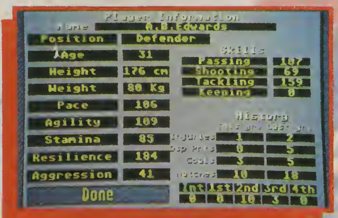
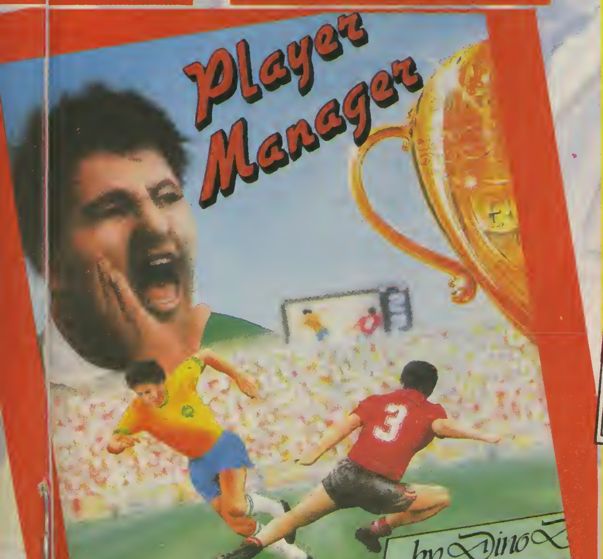
Done
AW TRAC FACILITY - WING ATTACK

Amiga Screen Shot



Player Information
Name A.B.Edwards
Position Defender
Age 31
Height 176 cm
Weight 80 Kg
Pace 106
Agility 109
Stamina 85
Resilience 184
Aggression 41
Skills
Passing 107
Shooting 69
Tackling 159
Keeping 0
History
This yr Last yr
Injuries 1 2
Disp Pts 0 5
Goals 3 5
Matches 10 18
Int 1st 2nd 3rd 4th
0 0 10 3 0
Done



THE FINAL WHISTLE
Amiga - ST £12.99

Raises the skills required and gameplay of KICK OFF 2 to new heights.

Two extra kits.
Look at any player stats. (attributes and skill) before selecting squad.

Totally new corner kicks with full control of the power, height and trajectory of the ball.

Enhanced throw ins and penalty shots.

Provision to flick the ball in the air and do a blinding header or a spectacular overhead kick.

New two players team mode. Player 1 in position or nearest to the ball and player 2 in position or keeper.

Linesmen and referee on the pitch. (EXP. Amiga Only).

A new player attribute FLAIR. A player with a high level of flair will try a solo attempt at the goal.

4 new pitches - Wembley - Icy - Muddy - Non-League

And Lot's More

WINNING TACTICS (£6.99 - February.) - A collection of tactics for use in Player Manager or KO2 with full explanations.

RETURN TO EUROPE (£9.99 - April.) - Three European cup competitions. UEFA cup - European Cup - Cup Winners Cup.

GIANTS OF EUROPE (June) Best teams of Europe on one disc.

SUPER LEAGUE - Four division league with 24 teams in each division. Automatic promotions and relegations. Teams from GIANTS OF EUROPE can be loaded into 1st Division.

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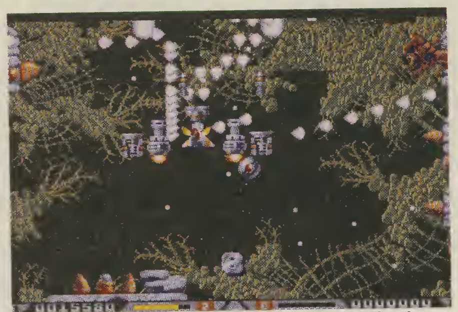
THE GAMES YOU

The time has come to put down the scanners, the genlocks and the modems, and reach for the joystick as Trenton Webb, reviews editor on *Amiga Format,* takes a look at the all time great games for the Amiga.

"Death from above": shoot-'em-ups

Xenon II
Image works
£24.99 • Tel: 0444 831545



• Xenon II: *Your motive - Just got to get the next level.*

The Bitmap Brothers in full effect. *Xenon II* is a finely tuned kill frenzy that's topped off with exquisite graphics and a *Bomb The Bass* soundtrack. As the vertically scrolling blast unfolds, firepower's slowly improved by collecting icons that grow into an outrageous armoury. This is supplemented by mid and end of level shops where any cash collected can be spent on even more death dealing devices. *Xenon II* is filled with large easily killed beasties.

The gameplay emphasises being in the right place, at the right time, carrying the right weapons. Non-fatal scenery and the ability to scroll backwards make it a user friendly 'bloodfest'.

Graphics:	9
Sound:	10
Instant appeal:	7
Lasting interest:	5
Addictiveness:	8

Battle Squadron
Electronic Zoo
£24.99 • Tel:0453 887008

Arcade quality graphics and an arcade quality game. Two players (on joystick or mouse) get the chance to fly over, and into, a nest of alien nasties, using smart bomb technology, plus increasingly powerful powerups, to survive.

One and a half screens wide, *Battle Squadron* is tough going with huge waves of enemies, 'invisible' beasts, and no time to breathe, let alone sit back and look smug when something goes well.

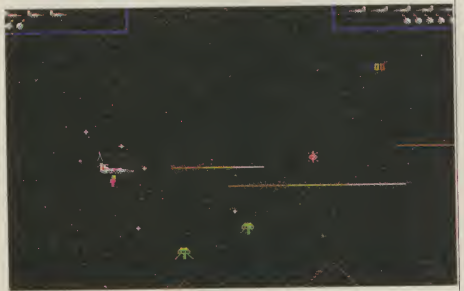
You don't have to wear out the fire button because one shot kills the little alien enemies, this makes game-play that bit more arcade than computer based. Not a vast amount for the brain, just masses of action compressed into seconds.

Graphics:	10
Sound:	6
Instant appeal:	6
Lasting interest:	5
Addictivness:	5

Defender II
ARC
£17.38 • Tel: 0753 33344

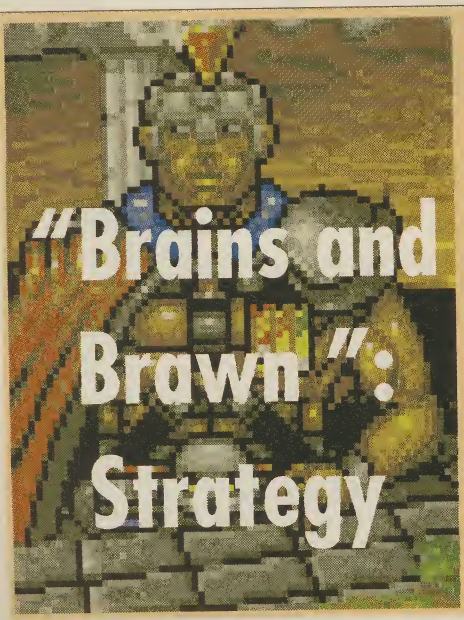
Brutal graphics make this one hard to accept, but this second generation hybrid of the arcade classic is incredibly playable. Whizzing about a horizontally scrolling world, saving civilians from alien slime bags, once the strange control system has been mastered, it begs to be played. Pacey stuff played with reactions rather brains. The package also contains the original *Defender* and another similar title.

Graphics:	1
Sound:	5
Instant appeal:	5
Lasting interest:	7
Addictivness:	9



• Defender II: *"Amphetamine crazy" points pig out!*

"Brains and Brawn": Strategy

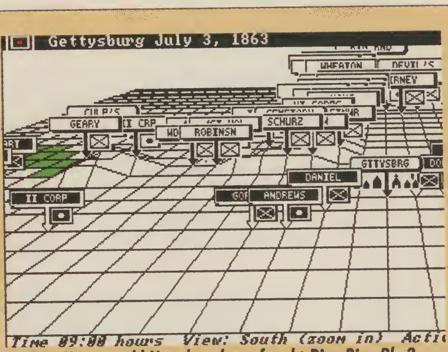


UMS
MicroProse
£29.99 Tel: 0666 504326

Flexible table top wargames construction set applied to the Amiga. It can be used to re-fight famous battles (France vs Britain - Waterloo) or fantasy bashes (Orcs vs US Marines - Gettysburg).

An effective wargame engine, it takes all the tedious table reading out of re-matches. It lacks a graphic edge, but has a deep, deep strategic bite that true wargamers dream of.

Graphics:	1
Sound:	1
Instant appeal:	1
Lasting interest:	10
Addictiveness:	10



• UMS: *How would Napoleon have fought Dien Bien Phu?*

Deuteros
Activision
£24.99 • Tel:0734 311666

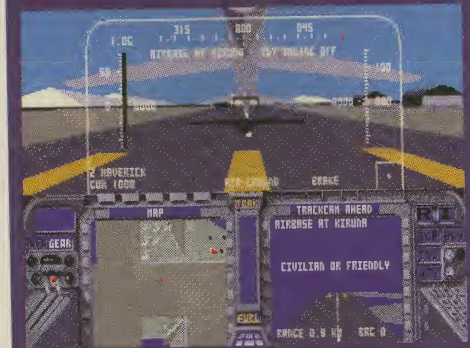
The sequel to *Millenium 2.2* is a vast game that takes man from Earth to orbit, to the Moon and beyond. Starting as a simple mineral gathering exercise it soon

U MUST HAVE

"Be there":
simulations

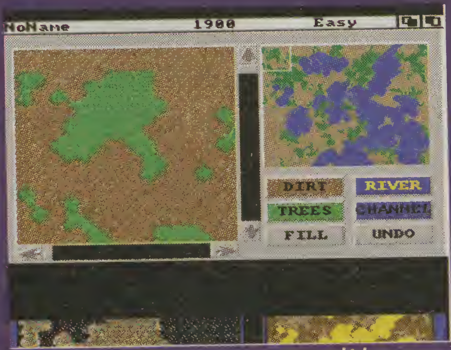
F-19 Stealth Fighter
MicroProse
£29.99 • Tel:0666 504326

State-of-the-art plane, state of the art sim. Fly the 21st century warplane in a game that perfectly suits the machine. Strategy and sim collide as you plot a path past radar, remain hidden, strike instantly and run away! Slick presentation and four different battlezones make keeping your disk saved pilot in one piece a tall order. With over 10 different difficulty settings you can make this a white knuckle test of guts, skill and brainpower if you wish.



• F19 Stealth Fighter: *Sssssh, test the best and survive.*

Graphics: 9
Sound: 1
Instant appeal: 9
Lasting Interest: 10
Addictiveness: 9



Sim City: *Town planning, it's not as easy you think.*

Sim City
Infogrames
£24.99 • Tel: 081-3640123

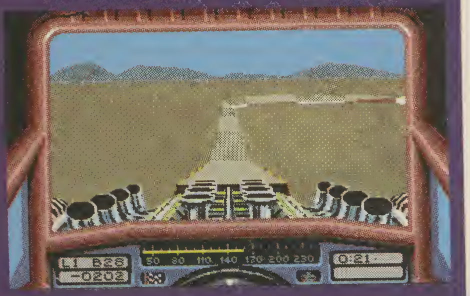
Total power is yours. Control a city and use its resources to build for tomorrow. Decide where schools, roads and power stations are built to benefit the citizens of San Francisco, Tokyo etc. Guard against natural disasters – earthquakes, tidal waves and Godzilla to name but a few - and make the most of meagre initial finances. It's educational and challenging as inconsequential actions wreak unimaginable havoc. Lumpy graphics damage the overall package which looks like a spread sheet. Expansion disks are available with different settings and problems.

Graphics: 1
Sound: 2
Instant appeal: 8
Lasting Interest: 10
Addictiveness: 10

Stunt Car Racer
Micro Prose
£24.99 • Tel: 0666 504326

Two car roller coaster races on 16 insane tracks. Huge jumps and massive drops damage the car which has to be nursed through each season. Drivers aim to win through four divisions up to the super league – successful drivers can be saved to disk. Simple design and real speed make this the first game to really simulate the feeling of off-road racing. Best played against another player using a serial link, virtual racing is here!

Graphics: 7
Sound: 1
Instant Appeal: 10
Lasting interest: 9
Addictiveness: 10



Stunt Car Racer: *Feel the need for speed (and a sick bag).*

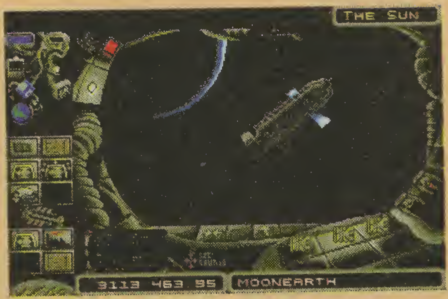
becomes another game entirely, with huge logistical problems. Great graphic screens filled with easily used icons help the game to speed along.

The game is beautifully paced, rewarding players yet puzzling them at every step. Enigma, surprise and shock are always just around the stellar corner!

Graphics: 9
Sound: 7
Instant appeal: 9
Lasting Interest: 9
Addictiveness: 10

Powermonger
Electronic Arts
£29.99 • Tel: 0753 49442

Populous goes to war! You control a nation of little people who live in one of 195 fractal lands. They are given your orders by Captains who tell them when to invent, feed and fight.

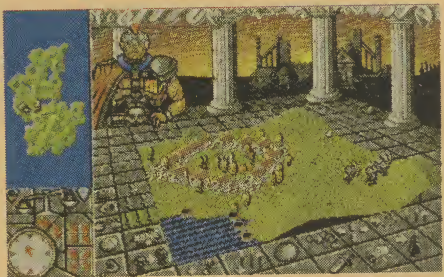


• Deuteros: *Crisis management among the stars.*

All icon controlled, it is a game of hidden secrets as each person of the land you're trying to conquer has their own name and personality. The straight strategy is made all the more awkward because you are competing against three computer warlords.

Move from land to land until the whole world has been subjugated. A truly original game with great graphics, it is strengthened by the imminent arrival of both a tips book and data disks – First World War and American Civil War scenarios!

Graphics: 9
Sound: 9
Instant appeal: 6
Lasting Interest: 10
Addictiveness: 10

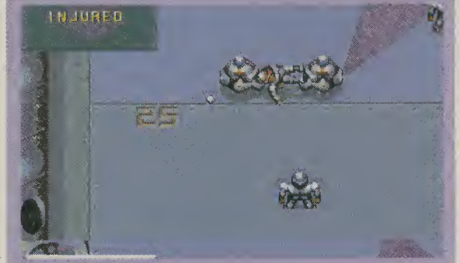


• Powermonger: *War and peace at your beck and call*

"Dont fit": various

Speedball II
Image Works
£24.99 • Tel: 0444 831545

Take one game called *Speedball*, which was good in its day, multiply its playability by about a million and you've got *Speedball II*. A futuresport sim, it's like *Kick Off* pace wise, but with a much darker more violent edge. It can be played as a one off arcade challenge or against the computer in a race for promotion to the first division. Fast, furious and oh so gloriously nasty. It has great graphics, strong sound and gallons of gameplay. The best futuresport game to date.

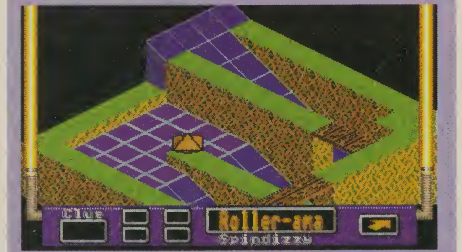


Graphics:	10
Sound:	9
Instant appeal:	9
Lasting interest:	10
Addictiveness:	10

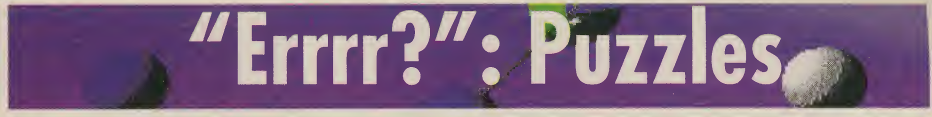
Spindizzy Worlds
Activision
£24.99 • Tel: 0734 311666

An 8-bit game comes of age on the Amiga. You control a spinning top which has to be guided around 30 different planets.

Each has a theme and features jumps, switches and puzzles that push the mind and joystick to their limits. The control is spot on, the game now scrolls (even the ST had flick screen scroll) and a classic game concept to back it up. With each world comprised of multiple levels plus bonus levels and hidden rooms it is huge but never daunting.



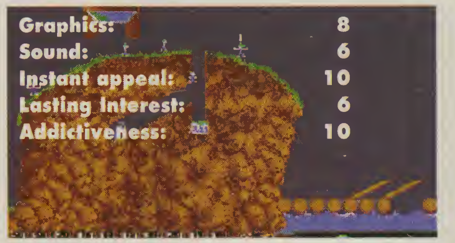
Graphics:	9
Sound:	5
Instant Appeal:	9
Lasting Interest:	10
Addictiveness:	10



"Errrr?": Puzzles

Lemmings
Psygnosis
£24.99 • Tel: 051-7095755

A puzzler with a difference, *Lemmings* sets you the task of herding hundreds of Lemm's from A to B using individuals to direct the group. In their way are huge drops, traps, water, fire and brick walls. Icon given commands must be clicked on to certain Lemm's who will blaze a trail for the herd. Incredibly cute and incredibly cruel – you blow up Lemm's who no longer serve a purpose! The game is 100 per cent addictive. Small Lemm' sprites are full of character, charm and to make us humans feel smug, stupidity!



Graphics:	8
Sound:	6
Instant appeal:	10
Lasting interest:	6
Addictiveness:	10

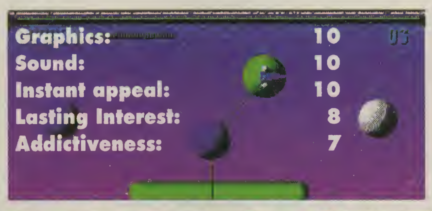
Puzznic
Ocean
£24.99 • Tel: 061 8326633

Slide tiles around an enclosed space so that similar patterns touch and disappear! Played against the clock it is a simple idea that's cunning in design. Well converted from the coin' op it has charm and is easy enough to woo puzzle beginners into play. Later levels however, force the brain into lateral thinking overdrive. A simple game that is just very, very playable.

Graphics:	7
Sound:	4
Instant appeal:	10
Lasting Interest:	7
Addictiveness:	8

E-Motion
US Gold
£24.99 • Tel: 021 3563388

Thrust with balls, nuclear physics for fun! Floating sphere's represent molecules that have to be touched against an object of a similar colour to make them disappear. Touching the wrong colour creates a new molecule of a third colour. You control these molecules with a *Asteroids* style ship, which is used to nudge them around. Brain-blasting fun!



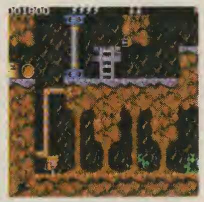
Graphics:	10
Sound:	10
Instant appeal:	10
Lasting Interest:	8
Addictiveness:	7

"Insert Coin": Arcade

Rick Dangerous
MicroProse
£24.99 • Tel: 0666 504326

Tricky Ricky is back and this time he's bought one of the best games ever. five levels (of which you can attempt the first four in any order) of Flash Gordon style leaping, bombing and shooting commence as the man with no legs hits top gear. Each world - ice, mud, trees and space ship - has its own special dangers as well as a host of traps and nasties. With a loads of restart points it's not as frustrating as RD 1 and twice the fun and excitement. Brilliant graphics, cartoon links and fun sound make it the arcade puzzle king.

Graphics:	9
Sound:	6
Instant appeal:	10
Lasting Interest:	8
Addictiveness:	10

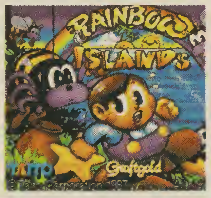


Rainbow Islands
Ocean
£24.99 • Tel:061 8326633

So cute you'll want to puke, so addictive you'll not have time to. Console-style arcade classic sends Bub, one-time of *Bubble Bobble* working his way up screen to avoid a rising tide.

He shoots rainbows out in front of him that kill enemies and provide handy platforms to stand on. Full to the brim of secret rooms and hidden bonuses which make repeated play an absolute must. Brilliantly paced and immensely playable. Without a doubt, this is sheer software excellence.

Graphics:	9
Sound:	6
Instant appeal:	10
Lasting Interest:	10
Addictiveness:	10



Kick Off II - The Glory!
Anco
£24.99 • Tel: 0322 292513

Kick Off II is a game no Amiga owner should be without. Ostensibly just a football game, *KO II* rules the roost sales-wise. It is an overhead view game with small sprites and a huge pitch area which scrolls vertically, following the ball. Control flicks to the player nearest the ball, who has masses of kicking options ready at the waggle of a joystick. Players can trap, chip or swerve the ball and don't have it magically glued to their foot as in other soccer sims, but must dribble properly. Red cards depend on the ref, so it pays not to tackle harshly. Packed with a host of other features too numerous to mention. If you don't own it and want *the* sports game, buy it. Even if you don't like footie (mad fool) just one session of Kick Off II, will get you hooked!

Graphics:	8
Sound:	2
Instant appeal:	10
Lasting Interest:	10
Addictiveness:	10

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JAM is typeset, laid-out and produced on an Amiga 500 and an Amiga B2000 - living proof that the Amiga is ideally suited to serious pursuits other than playing games. ***JAM*** concentrates on the applications and programming side of the machine, never afraid to go in-depth when the occasion calls for it.

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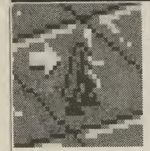
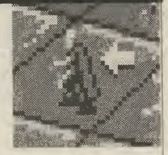
WIN! WIN! WIN! POWERMONGER



10 copies of the best-selling Amiga game to be given away for nothing. That's £299.90 worth of brain teasing pleasure on a plate. Basically, you pay for the stamp, answer some easy questions, and before too long you could be running a planet. Good innit?



Argue if you will, but we think that *Powermonger* from Electronic Arts is one of the best games ever to be released for the Amiga. It makes use of *Populous* -style graphics which bring you fractal landscapes, 195 of them to be exact.This is no mindless shoot-'em-up, nor is it in anyway cute or silly. There's raw power, strategy, fear, tension, brains, brawn and general tingliness to the games-playing senses.

All of this can be yours if your one of the ten readers lucky enough to win a copy.

Powermonger would normally set you back £29.99 but Electronic Arts called up and said: "Your readers are such a marvellous bunch of people so, hey, why not have £299.99 worth of software to give them."

We said: "Yeah, but we'll have to make them work for it. What we'll do is set 10 easy questions based on power and things. The readers will love it."

"You do that, and jolly good luck to you", said Electronic Arts.

So here you are, 10 questions away from possible world(s) domination. Ready, steady, g-g-g-go!!!!!

1) Who said: "Power tends to corrupt and absolute power corrupts absolutely".

A) Mickey Mouse
B) David Lynch
C) Helmut Flake
D) Lord Acton

2) Who wrote *Power to the People?*

A) Bob Dylan
B) John Lennon
C) Bach
D) M D Sade

3) Which is NOT an anagram of the word, Power?

A) Wreop
B) Pwroe
C) Rpowrq
D) Powre

4) Which is NOT a major international power?

A) Central African Republic
B) Great Britain
C) The USA
D) The USSR

5) Who do you associate with 'power dressing'?

A) Nuns.
B) Journalists.
C) Yuppies
D) Electricians.

6) In which film did *The Power of Love* by *Huey Lewis* and the News, feature?

A) *Gone with the Wind.*
B) *My Life as a Dog*
C) *Back to the Future*
D) *The Unbearable Lightness of Being.*

7) Black Power salute at the Olympics: what year?

A) 1871
B) 1652
C) 1968
D) 1988

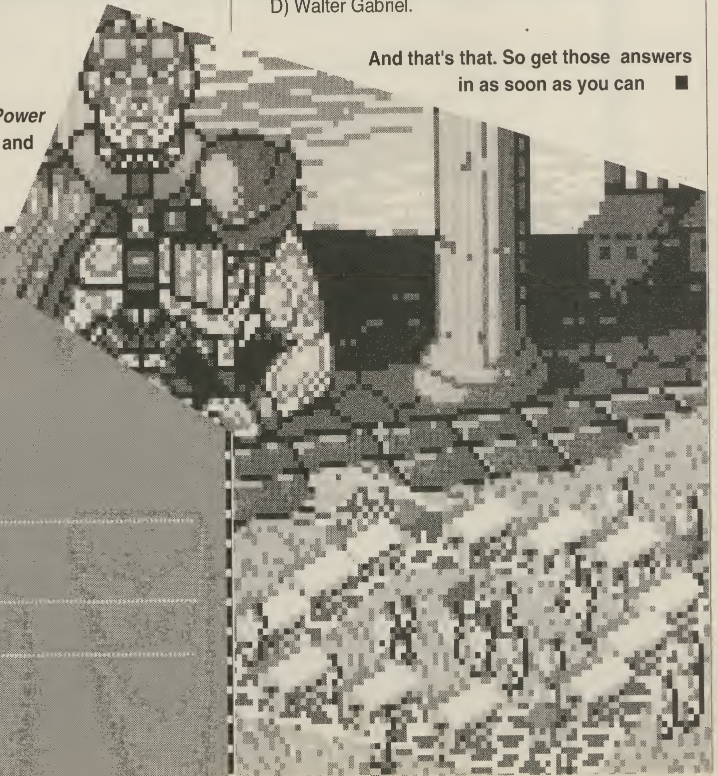
9) Which is NOT a form of power

A) Hydroelectric
B) Nuclear
C) Existential
D) Electrical

10) Who was well-known for his love of power?

A) Wurzel Gummidge.
B) Dylan the Rabbit.
C) Adolf Hitler.
D) Walter Gabriel.

And that's that. So get those answers in as soon as you can ■



Fill in your answers to the questions, write out your name and address and stick this coupon on the back of an postcard. Then send it to: *Powermonger* Competition. New Computer Express, 30 Monmouth Street, Bath BA1 2BW.

Answers: 1) 2) 3) 4) 5)
6) 7) 8) 9) 10)

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COMMODORE TALKING

We paid a visit to CBM's Maidenhead HQ to discuss CDTV and more with CBM's national sales manager, Kelly Sumner.

Can we start with CDTV. Is there a rock solid release date?

We've been liquid with our launch dates because the importance of this product - it's definitely the most important release we've ever made.

We have already launched in the States on the 7th of February. We're launching in Germany on the 12th or 13th March. We've pencilled in a launch for the beginning of April in the UK. That's when we launch to the trade. At that time we certainly hope that retailers will have the stock as well.

How important is it for Commodore?

There's no denying its importance. But if it fails, and I don't think it will, we won't go down. It could quadruple are profits.

How many titles will accompany the launch?

I believe it's forty. The average price is £34.99. Some will be sub-£20 and some will be very expensive. By the way there are also some details built-in to the machine which we have only released to the official developers which should control the quality.

And the definite price?

£599. That's definite.

What about the competition?

I don't think there will be any. People were waiting around for CD-I. I don't think the competition will come from there. There will be a number of players but there won't be a standard. The people who sell the most product will make the multimedia standard. We have the platform. They have the CD technology, we have the A500. CD is easy from there. They've taken four years, five years to develop CD-I. We've taken what? Two years.

We know you've done an extensive amount of research on the CDTV. What kind of feedback have you been getting?

What we found from the research is that the people who will uptake the product very quickly, and the volumes, will come from the corporate environment. And when we talk about corporate we include education as well.

People, for instance, will use it as a learning tool within education, will use it as a point of sale system in stores, people will use it as a mass storage or a learning aid, an interactive learning aid, within corporates.

So you thought that you had a straightforward consumer product but you discovered that it could also be popular as a kind of interactive video-disc training product?

That's right, that's right. I mean it has been seen as a kind of businessey type product. The number of corporates is staggering. I went to visit a large company last week and they're highly impressed.

So the reaction of volumes going into corporate areas, has this redefined the way software has been developed since the initial plans?

No, because the companies, all bar one or two, will have their own development teams. So what they take obviously is the CDTV, but also fairly heavyweight A3000s with 100, 200Mb hard disks and are developing on the A3000 for the CDTV. So they're doing it all themselves, they're not going to be using any traditional developers out in that market. Some of their developments, may actually have a positive effect in some time. Some of the things they've developed for their own in-house uses may at some time come onto the market as a retail product to sell to the general public.

Selling CDTV

"…. computers will never be mentioned on any packaging ... it looks like a video. This is not a computer, there's nothing to do with computers here."

Have you got any definite names for developers?

Well I haven't got a whole list but I mean all the traditional guys, all the gamesy guys like Ocean and the Pysgnosis, they're all there but there's lots and lots of others.

I believe world-wide that there's 300 developers and I believe that there's something in the range of 80 in the UK. But there's some quite different people, who have never done this kind of thing before. It's very diverse. Roland have just done *3-D* Sound.

The Bitmap Brothers have picked that up and have redone the tracks for *Xenon 2* with Roland so when that is released on CDTV. It will have 3-D Sound which is the first time that technology has ever been used.

Kelly Sumner. National sales manager for Commodore UK

There's lots of non-traditional developers out there who are in books or into the record industry, media of some sort who are going to use CDTV in a commercial way which your readers will be able to purchase.

It is a bit of a hi-tech machine to the general consumer, won't it be scary to some people?

The thing that scares most people off is the keyboard, all you've got is a remote control - anyone can use a remote control. I think that because we're not selling it as a computer, computer will never ever be mentioned on any packaging, any point of sale, any literature, anything, they haven't got this thing 'computer', they've got this thing that it looks like a video, I've got the remote control, I can interact with it.

There's no computer in there. I mean you never see on washing machines 'computer controlled' and some of them have got nearly as much circuitry as you find in a CDTV. I think there won't be any kind of techno-fear. If you look at the box, there's nothing there that links it to a computer. Even when it says keyboard, it says 'For interacting with productivity titles' now you make of that what you want, but it doesn't say database, word processor, spreadsheet, all those kind of things that people shy away from. What we're saying is that this is a multimedia player. This is not a computer, there's nothing to do with computers here.

The other thing is that computer are ugly things, and mother will not have an Amiga, or whatever machine, sitting in the living room with all the wires all over the place so we've designed this machine to sit with the video under the TV and everyone will be quite happy to have it in the living room. That's the whole idea of it.

Find out more by turning to page 28

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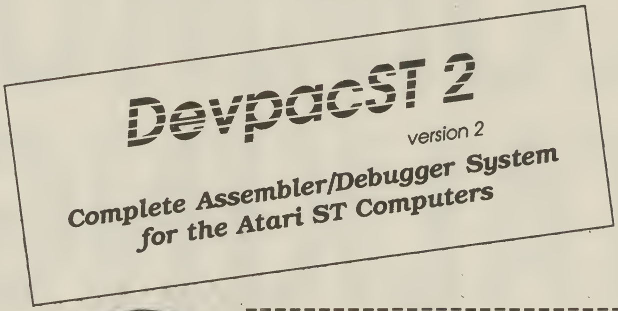
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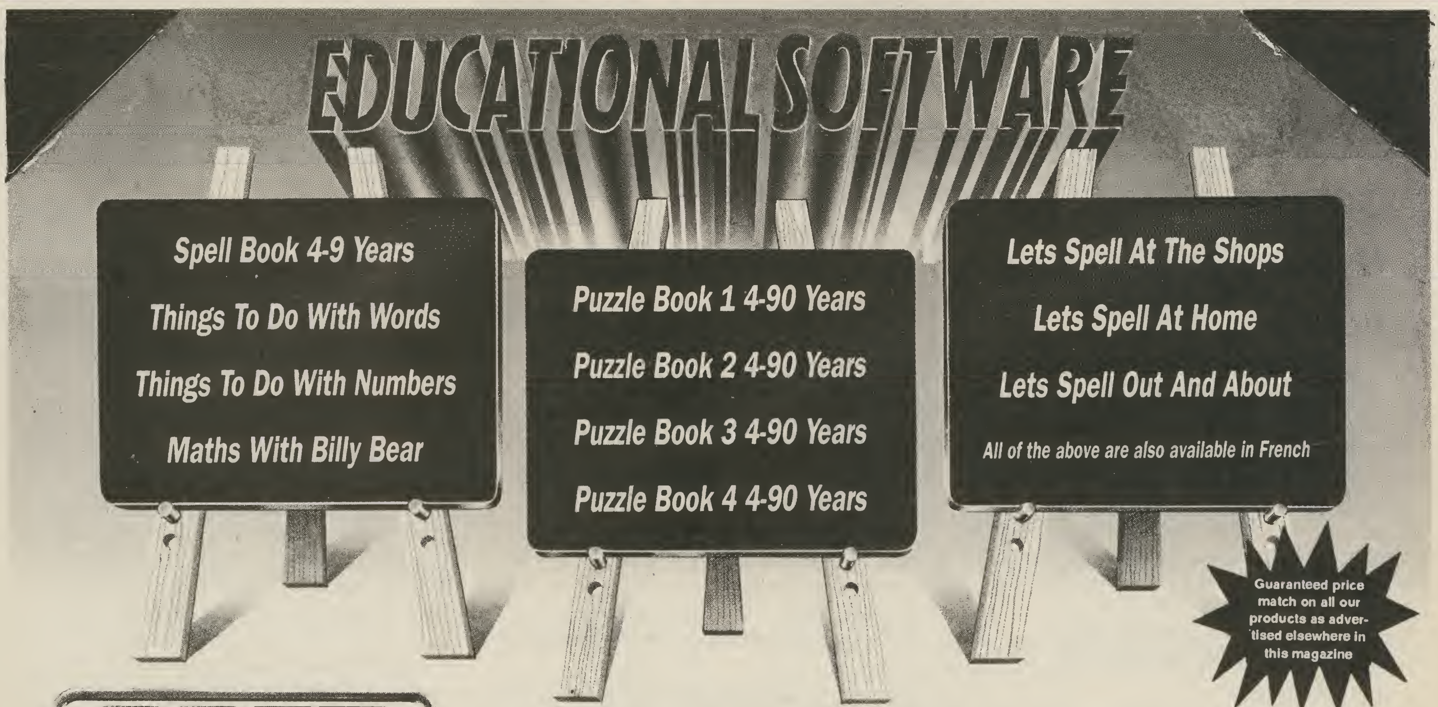

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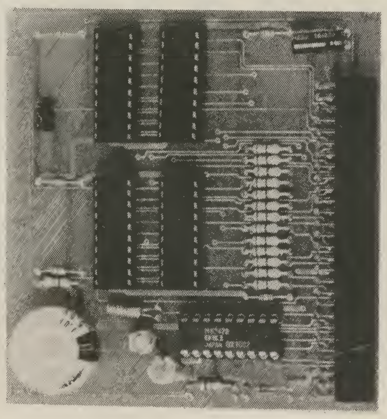

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COMMODORE TALKING

We conclude our interview with CBM's national sales manager, Kelly Sumner.

How would you say the traditional developers are coping with the aspect it isn't a computer?

Very well. I mean it's like anything, there's a learning curve. They know the Amiga very well. What they've got to get their heads round is that you've got to interact with it. You've got to get away from the normal gamsey shoot-'em-up things. It's got to look appealing. If you look at a lot of the really successful games recently, it's family biased. Things like *Lemmings*. They're making big, nice looking graphics. Not people shooting each other because it as to appeal to mother, father, daughter and son.

It sounds very much like the early days of BBC television. With the box in the corner of the living room being more than just a magic object of entertainment. There seems an almost evangelical desire to educate as well. There seems to be the idea that it's more than a machine, that there's a cultural difference you're trying to make.

That's it, yes there is a cultural difference. That's how we're going to sell it. Just playing games is not a reason to buy. They can go out and buy a C64 or Amiga for that. Why the hell would you need a CDTV for that? We have to give them real credible reasons to buy. Parents will spend money to educate their children. That's why encyclopedia salesmen make so much money, and they're not cheap.

Isn't interactive multimedia a complex idea to get across? Even people in the industry who claim to be able to pin it down, actually have problems with the idea.

Basically we're just saying that it's a combination of video, graphics, animation, and music put together. It's a number of medias and explained like that it's not that complex. The problem is that there's no standard for multimedia. It's like the old Apple days. People were talking about desktop publishing before Apple came along. What they did was to give the solution, they gave the means to achieve DTP. And people have been talking about multimedia machines generally available. Our idea is that people are bored sitting in front of the TV. This machine connects to the TV and allows you to decide what you do with the television.

Now the Amiga itself, or rather themselves. Where do they go?

The whole idea of Amiga when we bought them out was to keep developing the technology. Look at the A3000 compared to the A1000, huge leaps forward. Whether it be the A500 or CDTV we have groups of guys sitting there trying to improve the products all the time. Some things you will see, some you won't. I've been to this room in Westchester USA and saw all these machines which have been developed but which we will never seen.

We had to pick a product range including laptops and that kind of thing and there was all this stuff. 20 different kinds of mice. The whole idea of Amiga is for people to grow with the technology.

There's one thing I can say is that people will not be left with a duff machine in ten year's time.

As you rightly said, there will be a CDTV drive for the A500. There will be CD drives for the other machines. I don't think there's the need to run full audio-CD in the A3000 for example, so some of the tech-specs will differ.

Selling the Amiga

> **"I like to think that it's the Reebok of the industry. The Amiga is the machine that kids aspire to...'**

But will CDTV draw Commodore away from it's traditional user-base?

No,certainly not. We sold over 140,000 A500s between September and December in the UK alone. It is a very, very important area for us. Other companies, any other company would give there right arms for that kind of support and product..

Will people be developing first for the CDTV and then the Amiga, will it be different or parallel. Will the Amiga be a poor relation?

No I don't think so. At first there will be a certain amount of shovelware – port overs from the Amiga to the CDTV. Programs will be re-written for the CDTV, but there will be two different development teams for the software generally.

For example with CDTV's infra-red you need to sit further away so the graphics on a game like Sim City will have to be bigger. You should stop thinking of CDTV in the same line as computers.

What's happening to the machines which have come from the recent A500 trade in deal?

It's been going very well, people were bringing in all sorts, and hopefully they'll give them to charity. We certainly don't want to see VCS2600s and all that stuff, there's been a lot of STs too (laughs).

Talking of which what have you made of Atari's recent actions?

Quite strange. The way we've always marketed the Amiga has been as a superior product, how superior is questionable at times. But by them going to £299 and us at £399 what they're saying is that we're £100 better. People don't buy what they think is cheap anymore. They buy what they know is the better product. A few years ago people would buy 'own brand' they don't do that anymore, they buy a brand leader. And what Atari did was to say, it's better, it's a brand leader. And we sold more this year than last. I think it had the reverse effect on their sales. To drop down £100, you have to sell a lot more product. It was good news for us. Obviously we're not going to dismiss anything they do, Amstrad do, Nintendo do, Sega do, because in business you have to look at all aspects but certainly they're not the competition they used to be.

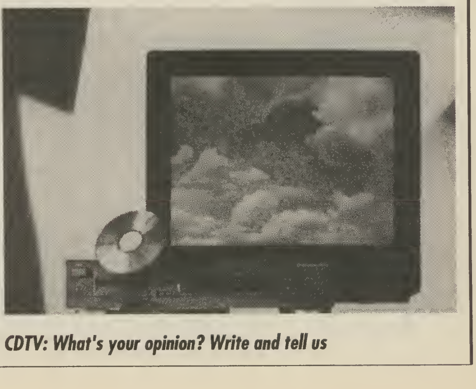
So you have a brand identity?

I like to think that it's the Reebok of the industry. The Amiga is the machine that kids aspire to. There is the same element of fashion too which is why we constantly upgrade the packs. I mean we couldn't sell Batman now could we?

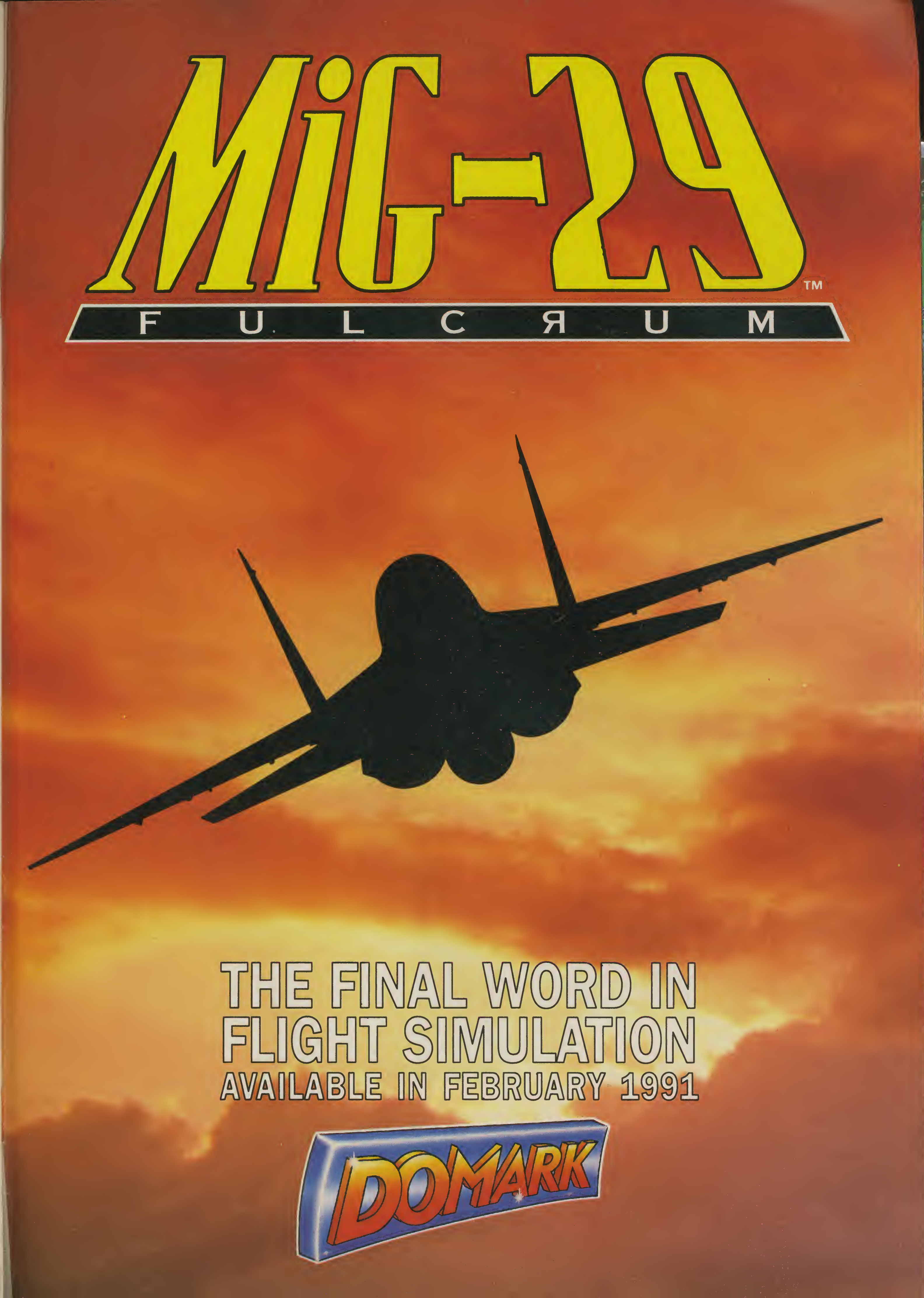
Do you think 16-bit consoles, like the Sega Mega Drive could take traditional A500 buyers away?.

They are not really selling large enough volumes at the moment to worry us unduly. Markets tend to be cyclical. In the States they've had the console market for two years now. We think that's changing back to computers. Certainly they're coming into the market, but the Amiga is an aspirational thing at the moment and it has a large base and momentum. The C64 is the machine which needs looking very seriously at.

Thanks very much for your time. ■



CDTV: What's your opinion? Write and tell us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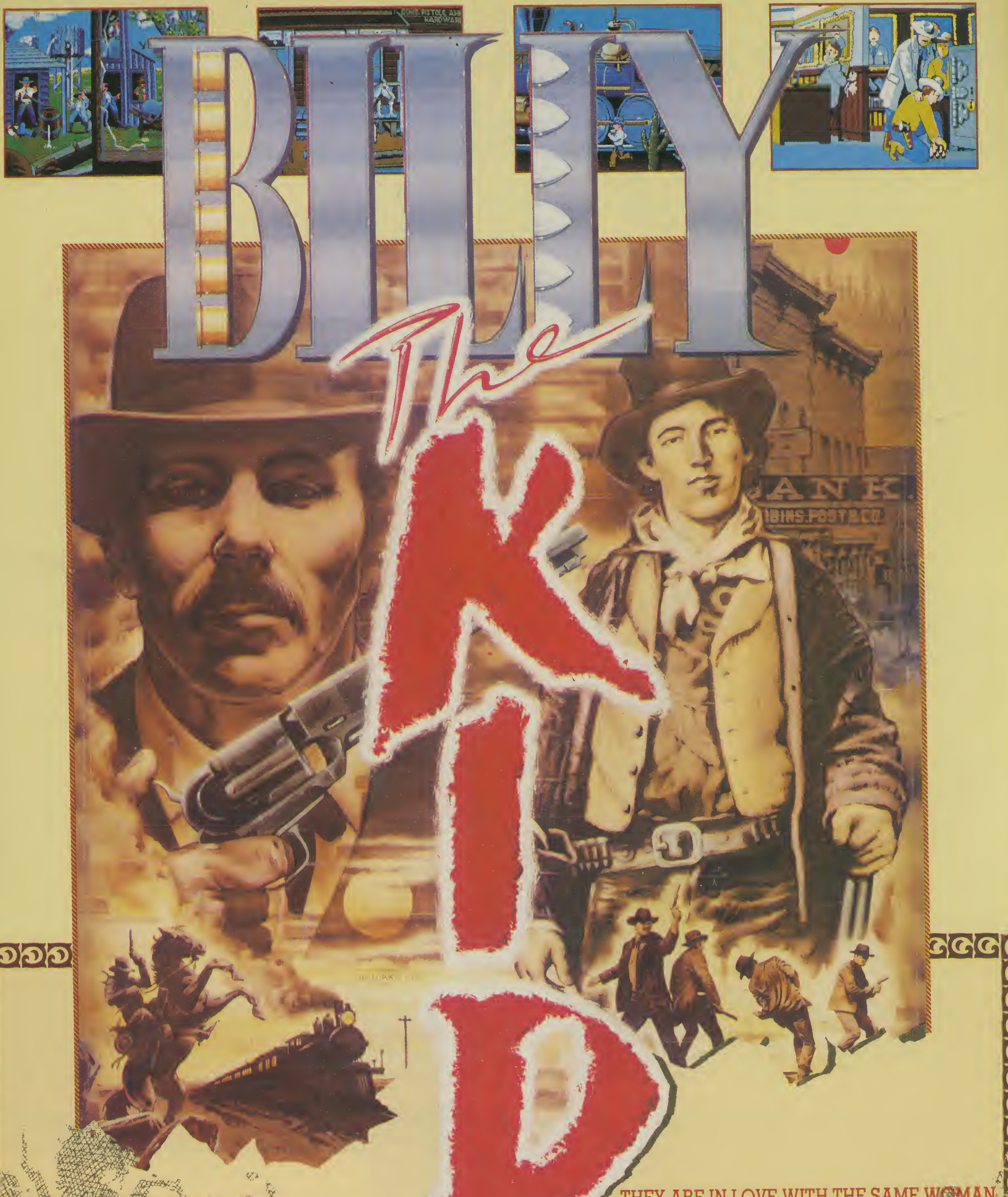

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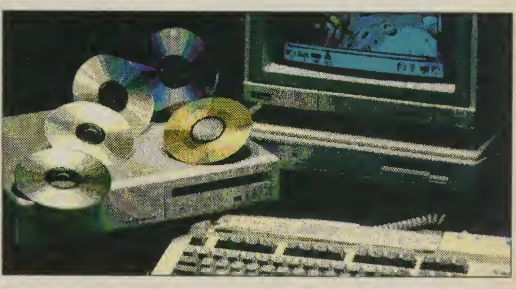

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